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### PRESENT POSITION OF SURGERY, RADIUM AND X RAYS IN GYNÆCOLOGY.<sup>1</sup>

By HERBERT H. SCHLINK, M.B., Ch.M. (Sydney),  
F.R.A.C.S.,

Honorary Gynaecological Surgeon, Royal Prince Alfred Hospital, Sydney.

I TAKE this opportunity of thanking you for electing me your Chairman, and, before performing this the final duty attaching to the position, desire to take the liberty of hoping that my successor will during his term of office be able to bring about an amalgamation of the Sections of Surgery, Gynaecology and Obstetrics. My reasons for advocating such a union are: (i) The monthly or quarterly meetings would be of wider and more varied interest. (ii) Larger attendances would be attracted. (iii) Fuller and more instructive discussion would take place.

In looking round for a subject upon which to base my remarks this evening, the Secretary sug-

gested that the present position of surgery, radium and X rays in gynæcology might with advantage be reviewed.

In war every weapon of offence meets with an overwhelming success until counter defensive measures are developed, when it takes its legitimate place amongst the other implements of warfare. So in the treatment of disease every new remedy meets with strong advocacy until its legitimate scope of usefulness is found by trial.

During the last decade radium and X rays have received undue prominence over other well established surgical practices, and the literature has been inundated with claims of radiological successes. Certainly the articles have been written mostly by specialists in this branch of work, and rarely do you find a surgeon of mature experience giving so sanguine accounts of radiological treatment.

There is hardly any field of gynæcology that the radiologist has not invaded and in which he has not claimed successes, so this evening, without wishing to detract from the good results, I should like to review the limitations as well as the dangers

<sup>1</sup> Read at the annual meeting of the Section of Obstetrics and Gynaecology of the New South Wales Branch of the British Medical Association on November 15, 1933.

and complications likely to arise from radiological methods of treatment.

#### Menstrual Disorders.

##### *Dysmenorrhœa.*

Much has been written concerning X ray treatment for the cure of dysmenorrhœa in young girls. Acting on the knowledge of the interrelationship of the endocrine glands, stimulating doses of X rays have been applied to the pituitary for this complaint. In my experience the method has proved useless.

X rays applied through several ports to the ovaries in order to stimulate ovulation or to produce a temporary cessation of the function have also been given a trial for dysmenorrhœa. In view of the diverse opinions recorded concerning the dosage necessary to produce permanent amenorrhœa, I regard this form of treatment as highly undesirable in young girls. In my opinion, those patients who cannot be cured by prolonged dilatation with a stem pessary, appropriate medication and hygienic measures, must await the sovereign remedy, child-birth.

I have never met a case of dysmenorrhœa in a young woman in which I thought it justifiable or necessary to perform double oophorectomy, and I am of opinion that this operation, as well as any radiological treatment prone to produce permanent amenorrhœa in young girls, should be abandoned by gynaecologists.

##### *Amenorrhœa and Sterility.*

When no pathological lesions in the pelvis and no systemic diseases, such as anæmia or tuberculosis, can be found to account for ovarian dysfunction, then it is said to be of functional or endocrine origin. Acting on the knowledge of the influence of the hormones of the anterior lobe of the pituitary on ovarian function, radiologists have claimed success in cases of amenorrhœa and sterility by the application of small doses of X rays to the pituitary gland. They claim similar results by direct application of small doses to the ovaries, some asserting that the rays directly stimulate function by causing hyperæmia of these glands, and others that they exert a selective destructive action on a large abnormal Graafian follicle, which is destroyed, as large Graafian follicles are more radio-sensitive than the primordial follicles or the *corpus luteum*. The theory is that by eliminating the abnormal follicle a normal one is allowed to develop and so to reestablish the menstrual cycle. Another group believes that the destructive action is exerted on a persistent pathological *corpus luteum*. However, as the *corpus luteum* is said to be more radio-resistant than the primordial and mature follicles, it would mean that sufficient dosage to destroy a persistent *corpus luteum* would result in a complete loss of ovarian function.

Van der Velden, Werner, Opitz, Frankal, Döderlein, Rubin, Kaplan, and recently Edeiken<sup>(1)</sup> have claimed successes, but the statistics quoted

are too small and inconclusive to be of real value in proving the efficiency of this mode of treatment.

##### *Menorrhagia or Irregular Idiopathic Bleeding in Adolescents and Young Women in the Child-Bearing Period.*

Most surgeons and even some radiologists, S. Z. Finzi,<sup>(2)</sup> Malcolm Donaldson,<sup>(3)</sup> and others, disapprove of radiological methods in the treatment of menorrhagia or irregular idiopathic bleeding in adolescents and young women in the child-bearing period for the following reasons: (i) The treatment is likely to prove ineffective, and when menstruation returns it is usually abnormal. (ii) There is a real danger of producing, even with a normal dose, a permanent amenorrhœa with all the associated menopausal symptoms, which are much more severe in young people than in patients over forty. (iii) There is clinical and experimental evidence (Murphy) that, should the patient become pregnant, there is the possibility of the birth of a deformed fetus or monster, microcephaly being the most common abnormality. Werner has also observed that animals subjected to radiation were most likely to abort and that there were some deformities in the offspring in the second generation.

Even those who approve of this method of treatment, Louis E. Paneuf,<sup>(4)</sup> George G. Ward,<sup>(5)</sup> William P. Healy<sup>(6)</sup> and others, issue a warning against large dosage and recommend that the patient should always be under-irradiated. If radium be used, they recommend not more than 200 to 300 milligramme-hours with one millimetre of platinum, and they point out the danger of the cumulative effect in repeated dosage. Other surgeons (Walter T. Dannreuther<sup>(7)</sup>) entirely disapprove of irradiation of the pelvis in adolescence, but advocate the use of X rays over the splenic area (one-quarter of a skin erythema dose repeated at three to four weeks' intervals) along with other therapeutic measures.

To summarize the treatment of this class of patient, both surgeons and radiologists agree that a preliminary curettage should be performed and that the scrapings should be submitted to the pathologist to exclude endometrial disease; that blood transfusions, calcium, arsenic, iron and copper, ergot and a high caloric diet, combined (after basal metabolic investigation) with organotherapy, be given a thorough trial; and that only as a last resort should radiological treatment be applied. In very desperate cases, when a young girl or married woman without children is in danger of losing her life through anæmia, I am of opinion that it is justifiable to risk a permanent amenorrhœa by the use of radiological methods rather than to perform hysterectomy. I have had several successes in dangerously anæmic girls by transfusion and the use of a small dose of radium *in utero*, the patients regaining a normal blood picture and regular menstruation.

##### *Menorrhagia or Abnormal Menopausal Bleedings in Patients About the Age of Forty.*

It is in menorrhagia or abnormal menstrual bleedings in patients about the age of forty that

radiologists claim their greatest successes, and they are divided among themselves as to whether radium or X ray treatment is the better method to produce the so-called bloodless castration. The exponents of the latter method point out that X rays affect only the ovary, whereas radium *in utero* has, in addition to its effect on the ovaries, a late obliterating effect on the blood supply of the endometrium which causes persistent leucorrhœa, pain and excessive atrophy of the womb. In this respect my experience coincides with that of the X ray specialists, as I have already had to do hysterectomy in half a dozen cases in which radium had previously been used for uterine hæmorrhage, and more and more of these patients are turning up in the outpatient department with intolerable uterine pain, persistent leucorrhœa and excessive recurrent hæmorrhage. The radium specialists put recurrence of bleeding down to insufficient dosage, but it seems to me that the higher the dosage, the greater the likelihood of the other two mentioned complications arising.

Apart from these common complications of the use of radium *in utero* many other sequelæ have been recorded. Pyometra is fairly frequent in cancer (a dozen cases have occurred at the Royal Prince Alfred Hospital since 1928) and occasionally occurs in non-malignant cases, the uterine cavity filling with pus until the tension overcomes the resistance in the cervical canal. A severe temporary toxæmia occurs in these cases, and at times the adnexa are involved in the reactionary inflammation.

Recently A. L. Dean, Junior,<sup>(8)</sup> has drawn attention to injuries to the bladder following the use of X rays and radium, and he records some 47 cases since 1927. He estimates that radium when *in utero* is 2.5 centimetres from the base of the bladder, and that for each 1,000 milligramme-hours in the usual applicators the bladder wall received one skin erythema dose. If the container slips out into the vagina, the effect on the bladder is much augmented. He points out that the commonest injury is ulcer at the base of the bladder, which usually appears two years after application of the radium. It is a tertiary radium reaction due to obliterated endarteritis, and occasionally costs the patient her life. Dean also describes a primary and secondary radium erythema of the bladder. He asserts that X rays do damage to a less degree.

Injury can also be done to the rectum by large doses of radium *in utero*:

One patient of mine was given a post-operative dose of 7,000 milligramme-hours of radium with one millimetre of platinum, and she had a most severe bowel reaction, passing blood, pus and mucus accompanied by the most severe tenesmus. It is still possible that a stricture might result.

Burns of the vagina resulting in chronic ulcers which take years to heal have been recorded, even after every precaution of efficient screenage has been taken. Stricture of the vagina, as well as senile vaginitis and vesico-vaginal fistula, have often followed the use of radium for carcinoma.

From these remarks, which mainly concern radium and to a less degree X rays, it is apparent that radiological treatment is not unattended by grave dangers.

There is still further complication caused by the destruction of ovarian function. The radiological menopause is often accompanied by a good deal of thyroid dysfunction. Norman White<sup>(9)</sup> quotes several cases of mild Graves's disease and admits its liability to cause or to aggravate neurosis. In my experience the menopausal symptoms are very severe after radiological sterilization. Even F. Hernaman Johnson,<sup>(10)</sup> an advocate of this form of treatment, quotes one of his patients, who was sterilized by X rays, as writing:

I had two periods after the last treatment, none since. But I have since suffered from headaches, dizziness, flushing and often from general depression. During the last few months I have been much better, but the two years after I was treated were dreadful, and if I had known what the X rays would do for me I think I would have remained as I was.

I have brought forward these various complications to show that the so-called bloodless sterilization is not all plain sailing, as the radiologists would have us believe; and, although I am not definitely opposed to radiological treatment in selected cases of bleeding from otherwise normal uteri at or about the menopause, I think that the surgical method of hysterectomy with preservation of one or both ovaries cures the bleeding state and allows the patient a much more comfortable climacteric period and no liability to the complications mentioned.

#### Chronic Metritis and the So-Called Myopathic Uterus.

Radiologists also advise the use of radium and X rays in chronic metritis and the so-called myopathic uterus, but to my mind both radium and X rays are very definitely contraindicated in the majority of such uteri. I admit that these agencies will stop the bleeding and will reduce the size of the uterus in most cases, but those who have read Dr. Chapman's paper<sup>(11)</sup> on the myopathic uterus and who have seen the slides of excised uteri shown by him, will realize that the pathological condition cannot be removed by radiological agency. It is more likely that it will increase the deposit of fibrous tissue and cause greater blockage of the arteries leading to a quicker third stage, namely, superatrophy. This third stage of the myopathic uterus might well be termed the genital dead tooth and leads to a whole train of uncomfortable symptoms for which hysterectomy has usually to be performed.

Moreover, in no genuine myopathic uterus is the pathological process limited to the uterus alone; the cervix is usually riddled with follicles of Naboth and the adnexæ are more or less chronically inflamed. I cannot conceive that irradiation will improve or do away with these lesions.

In his paper Dr. Chapman also gave the statistics of treatment of the myopathic uterus at the Royal Prince Alfred Hospital since the radium clinic was



started in 1928. These reflect the opinions of the whole of the gynaecological staff of that institution and clearly show that more and more of these patients are being treated surgically and that each year less and less use is being made of radium and X rays.

#### Fibromyomata Uteri.

The more experience I gain in irradiation of fibromyomata, the more limited become my indications for its use. In point of fact, the practice of our clinic admits only one indication, namely, when considerations of general health contraindicate operation, for example, cardiac, vascular and renal disease, Graves's disease, diabetes, pulmonary tuberculosis and other respiratory complications; radiation must, of course, be used for those who flatly refuse surgery.

Already we have removed three fibroid uteri treated by radium in which malignant disease subsequently developed, and we feel that anyone who fully appreciates the number of other pathological degenerations to which fibromyomata are heirs, will be extremely cautious in advising irradiation in place of the unequivocal curative method of surgery, which has an added advantage in that the ovaries need not be sacrificed. Notwithstanding the terminal blood supply of these organs after hysterectomy has been performed, it is now generally admitted that the menopausal symptoms are considerably toned down by their conservation, and in most cases they carry the patient on to her normal climacteric age.

Radiologists make much of the mortality following surgery, of its mutilation and of its effect on sex life.

1. In all well conducted gynaecological clinics the death rate has fallen below 1%, and I make bold to state that if surgery were eliminated and all fibromyomata submitted to radiological treatment the immediate and late death rates would be three times as great. Bailey places radium's immediate death rate alone at 1.5%.

2. As regards mutilation, to remove a diseased uterus is no more detriment to the patient's well-being than to extract a septic tooth. The wonderful improvement noticed in the patient's physical and mental condition after hysterectomy is proof enough that the so-called mutilation was necessary.

3. Regarding sex life, radiological methods, with their destruction of ovarian function and occasional cicatrization of the local parts, are much more liable to create sex frigidity and loss of this important appetite than the removal of a diseased womb. In point of fact, any experienced gynaecologist knows that the removal of this diseased organ or any other inflamed organ in the pelvis, which was a constant source of pain during the act, reestablishes the desire for sex pleasure. Any sex change that occurs after hysterectomy is purely psychical and is usually brought on by fears created by the ignorant talk of uninformed friends, usually lay, but occasionally medical. If the vagina has

not been interfered with, if the ovaries have been conserved, and if the patient has been given to understand that she still ovulates internally, no loss of sex impulse will occur. The clitoris, with its associated tactile sensations, the ovaries and associated endocrine glands with their hormones, and the interpreting psychical function of the brain are the chief factors controlling that complicated system of reflexes known as sex. Surgery can conserve all these functions, but radiological treatment must destroy one of them, namely the ovaries, to obtain its curative effect, and more often than not it leaves a painful uterus and occasionally a constricted or senile vagina.

For those who are still inclined to use radiological treatment for fibromyomata, I should like to point out some of the contraindications to its use as set out by Keene, Kimbrough<sup>(12)</sup> and others:

1. Tumours larger than a three-months pregnancy. These usually present degenerative changes which are not favourably influenced by irradiation, or it may diminish their blood supply and so start degeneration.

2. Rapid increase in the size of the tumour. This usually means degeneration, and operation is indicated.

3. Pressure symptoms. While disappearance of the tumour is a common occurrence following irradiation, the process is slow and excision is preferable.

4. Tumours associated with pelvic pain. This is usually due to some adnexal or degenerative complication, and radiation may light up the process.

5. Pedunculated tumour, both subperitoneal and submucous. Here radiation is useless and is often followed by rapid necrosis and infection.

6. Tumours in young women. Irradiation, to do any permanent good, must be given in doses of 800 to 1,200 milligramme-hours, which invariably produces a bloodless castration.

7. In profound anaemia, which is often due to degeneration of fibroids, radiation is not usually safe. If radiation is practised even on fibroids without degeneration in a very anæmic subject, the resistance is diminished and there is a possibility of necrosis or infection of the growth.

8. Radiation is to be avoided if stenosis of the cervix exists, for fear of pyometra or hæmatometra, and if radium is used, it must be placed well above the *os internum* for the same reason.

Radium should never be used without a thorough examination under anaesthesia, a diagnostic curettage and pathological examination of the scrapings. (i) Pregnancy must be excluded for obvious reasons. (ii) The exact size and position of the tumour must be ascertained. (iii) The presence of accompanying cancer must be known.

Finally, I should like to say that the application of radium and X rays for fibromyomata should always be under the control of a trained gynaecologist, who must first make an accurate diagnosis of the pelvic condition and then exclude the contraindications to their use. It is nothing less than



criminal for a man untrained in gynaecology to take on this responsibility. Nothing but the lack of all knowledge of morbid anatomy and general pathology can account for some of the extravagant claims made by the radiologist—phenomenal size of growth, the presence of pyosalpingitis, degeneration of the tumour *et cetera* are no contraindication to some of the enthusiasts.

#### Malignant Growths of Genital Organs.

The destructive action of radiological methods on genital cancer has been proved, and they have definitely earned their place in the treatment of all malignant growths of the female pelvis. The part they should play is still an unsettled question. As a preliminary to any remarks on genital cancer we must all recognize that the poor absolute results, both surgical and radiological, in female pelvic cancer are due to the late stage at which the patients present themselves for treatment. The ignorance of the patient and doctor are alike to blame.

#### Cervical Cancer.

A study of the world literature of cervical cancer as being treated today at the various clinics shows that the absolute five-year cures obtained by surgery and radiological treatment are about equal—15.4% to 36.4%. The statistical detail was published in THE MEDICAL JOURNAL OF AUSTRALIA, October 7, 1933, page 477. The relative cure rate for the four stages is about the same whether surgery or irradiation is employed. The relative cure rate is set out in the accompanying table.

Table Showing Relative Cure Rate of Uterine Cancer.

Group 1. Operable.	Group 2. Borderline.	Group 3. Inoperable.	Group 4. Incurable.
75% to 90%	35% to 50%	10% to 20%	Zero.

Therefore I am of opinion that some combination of radium therapy and surgery will give the best results, and in our clinic at the Royal Prince Alfred Hospital we use radium for all first, second and third stage cases, and in three to five weeks, and even after twelve months, remove the uterus by a radical Wertheim operation whenever possible. This method has given us a wealth of irradiated material, and the microscopic examination of it clearly shows the variability of radium action. In some of the specimens local growth has been almost entirely eliminated; in others very little destruction of the cancer cells has taken place. Radium has had no effect whatever on cancer in the lymphatic glands. We have had about seventy-five cases in which we have the original biopsy reports and the removed irradiated uteri, with records of the dosage, screenage and method of radiation used in each particular case. Our operation mortality so far has been nil, owing, we think, to the sterilizing effect of the pre-operative radium therapy and

Bonney's blue. Time alone will prove whether our method is superior to radium therapy or surgery alone, but, as far as we have gone, we feel, from a study of our irradiated tissues, that radium does not produce an absolute cure in all types of growth. We are entirely opposed to the use of radium or X rays in the fourth stage cases. Among the 210 patients treated by radium alone at the Royal Prince Alfred Hospital there were nine immediate deaths (4.28%). Most of these were in the so-called frozen pelves cases (Group 4). Two patients died from hydronephrosis due to pressure of the resulting radium induration on the ureters, and they indicate the danger of using radium in advanced cancer. In dealing with this class of case we have come to the conclusion that it is better to curette away the necrosing tissue and to apply zinc chloride or acetone, as the older gynaecologists did. This relieves the patient temporarily of discharge and hæmorrhage, and that is all we can hope to do.

#### Cancer of the Corpus Uteri.

As in cancer of the cervix, so in that of the body we use preliminary radium therapy and a radical Wertheim operation, except in the very enfeebled old women unable to stand operation. In these cases we depend on radium therapy followed by deep X ray therapy.

Our experience has shown that these old women must have their X ray treatment gradually administered, otherwise it makes them desperately ill and many have said that they would rather die than go on with the treatment. Dr. J. Gower Stephens informs me that he has devised a method of dosage that overcomes this disability to a large extent.

#### Cancer of the Ovary.

As regards cancer of the ovary, my only experience is surgical. I have two patients who have lived over ten years after operation. All others have died from recurrences.

#### Cancer of the Fallopian Tube.

Primary cancer of the Fallopian tube occurred in my surgical practice twice; one patient, prior to the days of radiological treatment, died from extensions shortly after her operation. The other is alive two and a quarter years after operation and shows no sign of recurrence as yet. This patient had 7,000 milligramme-hours with one millimetre of platinum screenage *in utero* post-operatively. The tube was discovered to be malignant only after it had been taken out. Two factors prevented a radical Wertheim operation being performed: (i) Dense adhesions and accompanying parametritis. (ii) The patient developed post-operative intestinal obstruction for which a life-saving operation had to be done.

#### Cancer of the Vulva.

The local growth in cancer of the vulva is undoubtedly diminished in size by radium and X ray therapy, and I think their application should always be preliminary to an attempt at radical removal of the vulva and inguinal glands. I have treated three patients by this method; two are dead and I expect

the other to die shortly. I have one case of ten years' cure by surgery alone, but the growth was at its earliest stage when operated upon. All my other patients have died from extensions.

#### *Leucoplakia Vulvæ.*

Radiologists advocate the use of X rays and radium for *leucoplakia vulvæ*. Any surgeon who has studied sections taken from leucoplakic areas under the microscope and who has seen the definite hyaline degeneration of the rete processes deep below the cornified superficial layer, can have little faith in any form of radiation as a cure for this complaint. My opinion is that excision of the area is the only method of dealing with this disease. Lotions, unguentums or rays are more than useless if it is a case of true *leucoplakia vulvæ*. Rays may even cause a malignant change.

#### *Conclusions.*

1. The use of radium and of X rays in the menstrual disorders dysmenorrhœa, amenorrhœa and sterility has given very doubtful results.
2. Bleeding in adolescence and in young childless women should be treated by radiological methods only after all other methods have failed, on account of their liability to create permanent amenorrhœa.
3. Bleeding in parous women about the age of forty is better served by hysterectomy, for the reason that the ovaries can be conserved and the menopause symptoms delayed or mollified.
4. In myopathic uteri and fibromyomata, except for a few selected cases, hysterectomy is the method of choice.
5. In genital cancer radiological treatment is a definite advance. In most cases it prolongs life, in some cases it produces absolute cures, and in others it often renders an inoperable growth operable. The best results, in my opinion, are to be obtained by a combination of radiological and surgical methods.
6. Radiological methods have no place in the treatment of leucoplakia. Radical surgery is the only efficient cure.
7. Finally, I believe that the friends of radiology are doing an ill service to the legitimate use of irradiation methods in gynecology by overstating the case and by allowing the physicist rather than the clinician to speak. The end results of misplaced radiological treatment have still to appear before the bar of professional opinion.
8. It will be some years yet before the true limits of usefulness of irradiation methods can be properly defined and accepted by gynecological surgeons of mature clinical experience.

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#### THE DOVETAIL JOINT SIMPLIFIED FOR BONE GRAFT PURPOSES.

By A. B. KEITH WATKINS, M.S. (London),  
F.R.C.S. (England), F.R.A.C.S.,

Honorary Ear, Nose and Throat Surgeon, Newcastle Hospital; Cranio-Cervical Surgeon to the Mater Misericordiae Hospital, Waratah, New South Wales.

ONE of the most important points in securing a successful bone graft is to obtain firm fixation of the ends of the graft. This is especially necessary where the bone ends to be grafted cannot themselves be held rigid by splints *et cetera* during convalescence.

In certain places splinting the ends of the bone is unusually difficult, and at the same time the bone is not thick enough to allow the graft to be firmly gripped by the ordinary methods, for example, hammering the graft into a deep groove made by twin circular saws, and probably in no site are the difficulties greater than in the lower jaw of an edentulous patient, where the ends of the bone cannot be fixed by wiring the teeth *et cetera*.

In this situation I considered the possibility of using a dovetail joint, but decided that the difficulties of making such a joint under operation conditions excluded it. However, a modification of such a joint was used in grafting a rib into the horizontal ramus of a lower jaw which had been removed for a myxomatous tumour. The only modification required to render the dovetail joint suitable for operative work was to use a flat circular end to the graft instead of the actual dovetail (Figure I).

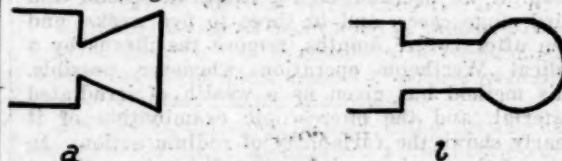


FIGURE I.

In practice the bed for the graft is prepared first. The round end of the bed is made with the flat trephine, which cuts over the whole diameter of its face, and which is often supplied with the geared-up drill handle known as the Swedish pattern (Figure II). This part of the operation must not be carried so deep that it completely perforates the bone, or much of the security of the joint will be lost.



The bed to take the neck of the graft is made the same depth with saws, chisels or burrs.

The graft is then prepared. A piece of rib or suitable piece of bone is selected and is clamped in a small sterile vice and is trimmed to size with sterile coarse files. The first part of this is facilitated by having a piece of flat metal sheet previously made the shape of Figure I b, and the correct size. This is clamped in the vice with the piece of bone, and, with it thus used as a template one can do the first part of shaping the bone rapidly.

As the bone must not be crushed in the vice, it is wise to tie a piece of thread to the middle of the graft and to anchor the other end of it to one's dress to prevent the graft falling should it jump out of the jaws of the vice whilst it is being filed.

The final fitting is done whilst comparing the graft with its bed, after which it is hammered into place. To anchor the graft more firmly, bone pegs can be driven into holes drilled in the centre of the round ends of the graft, and a kangaroo tendon can be put through pairs of holes drilled through the neck portions.



FIGURE II.

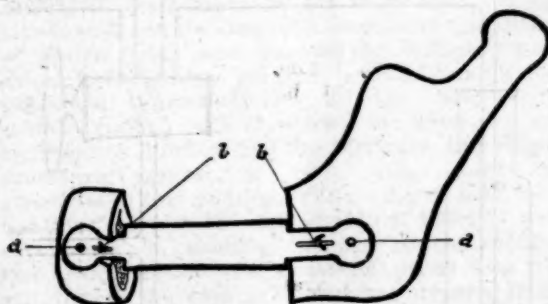


FIGURE III.

In the case referred to the final condition is shown in Figure III, and the result is still entirely satisfactory sixteen months after the operation.

#### STUDIES ON THE COMPOSITION OF THE GASTRIC JUICE.

##### PART I.

By G. V. RUDD, M.Sc.,  
Biochemist, Institute of Medical Research, Royal  
North Shore Hospital of Sydney.

Few analyses aiming at a complete survey of the substances present in the gastric juice have been published. The modern trend of research upon this question has resulted in a very full consideration of

the acidity and the chloride content of the gastric juice. It may be suggested, however, that such work leads to a rather too exclusive line of reasoning, for the many substances other than hydrochloric acid and neutral chloride which may be shown to be present in the gastric juice in appreciable quantities are undoubtedly of significance in a consideration of the chemical composition of the total secretion of the stomach. In the present communication it is proposed to deal merely with the question of chemical composition of the gastric juice, reserving for a subsequent paper the conclusions that may be drawn from a study of the chemical composition concerning the control of the acidity and the nature of the individual secretions that make up the whole gastric juice.

The earlier workers, in their analyses of gastric juice, usually devoted their attention, after the estimation of hydrochloric acid, to estimations of residue on drying and ashing, to examinations of preparations of enzymes and to the determination of physical constants. They usually obtained their specimens of gastric juice from Heidenhain or Pavlov gastric pouches or by the sham-feeding method of Pavlov. The most complete analyses of gastric juice are those of Rosemann.<sup>(15)</sup> Carlson<sup>(4)</sup> presented certain analyses made upon human subjects with gastric fistulae, and upon dogs. Other workers more recently have studied one or a group of substances occurring in gastric juice. Their results will be considered below.

The analytical results presented in this paper include figures for hydrochloric acid, sodium, potassium, calcium, magnesium and ammonium, and for chloride, inorganic phosphate, bicarbonate and protein. The effect of the mucoprotein of gastric juice on the titration of hydrochloric acid was studied in order to control the determination of acidity.

##### Experimental.

##### Collection of Specimens of Gastric Juice.

Human subjects were used. The fasting subject swallowed two tubes, one of which remained in the stomach whilst the other passed to the duodenum. Essentially the same technique was adopted as that previously described by the author.<sup>(16)</sup> In all cases in the present series of tests, however, the subjects swallowed the tubes without the aid of drinking any water. It was found also that duodenal intubation was more readily effected if the tubes were introduced first only for a length of 45 centimetres before the slow swallowing of the duodenal tube was commenced.

After preliminary thorough emptying of the stomach with the tubes in proper position, both tubes were connected to the apparatus for the continuous collection of the gastric and duodenal fluids. The gastric tube collected a fluid quite untinged with bile, whilst the duodenal tube yielded a viscid, deeply bile-stained fluid strongly alkaline to bromthymolblue. As the test proceeded, the duodenal tube yielded only very small quantities of darkly coloured bile. The continued absence of any

trace of bile pigment in the gastric fluid indicated that duodenal regurgitation had been completely prevented. The specimens obtained in the first twenty minutes of continuous collection were always rejected; after this the test proper commenced. In some patients gastric juice was collected at a rate of 0.75 to 1.75 cubic centimetres per minute, and was found to be strongly acid. This agrees with the observations of Pollard and Bloomfield,<sup>(13)</sup> that many individuals under basal conditions (with all stimuli to gastric secretion removed) secrete a juice of high acidity. In the present work, after the collection of two or three specimens of about twenty cubic centimetres, the test was in some cases terminated. In other instances, both where the first specimens collected showed an anacidity and where they were acid, a subcutaneous injection of one milligramme of "Ergamine" (approximately 0.5 milligramme of histamine) was then given and a further four or five specimens were collected, each being obtained during a fifteen-minute period. The strongly acid specimens of gastric juice obtained after histamine injection appeared freely at a fast rate (up to five cubic centimetres per minute), were of a watery consistency and were practically free from clots of mucus. The fourth or fifth quarter-hour collection after the injection of histamine showed a slowing down of the secretory rate and some appearance of mucus. At this stage the tests were terminated. All specimens were centrifuged at a high speed and the clear supernatant fluids were used for analysis.

#### Analytical Methods.

The methods used in the analysis of the specimens were either those which are generally recognized as standard procedures or methods which had been exhaustively tested to prove their applicability and accuracy with regard to the conditions of the analysis. They are referred to in some detail in the subsections below. All volumetric glassware was carefully standardized for the work; particularly was this necessary in the case of the Ostwald pipettes used for measuring the volume of fluid taken for an analysis. Reagents used were standardized with all possible care. In general, the greatest accuracy of which the methods used were capable was consistently aimed at. In the subsequent paper, which will show the need of these precautions for correct analyses, results will be considered which show that satisfactory accuracy can be achieved by the analytical methods used.

**Acidity.**—Titrations of acid in gastric juice have been performed by many workers with a variety of indicators, of which Töpfer's reagent and phenolphthalein, indicating free hydrochloric acid and total acidity, respectively, are the most common. The fact that other indicators are recommended (for example, Patterson<sup>(12)</sup> uses thymol blue) to show the end-points of the titration of free hydrochloric acid and total acidity shows that uncertainty still exists concerning the most appropriate pH value to which these titrations ought to be

taken. The ranges over which Töpfer's reagent (pH 2.9 to 4.0) and methyl orange (pH 3.0 to 4.3) change colour are so close that it has been customary in this laboratory to use methyl orange as indicator in free hydrochloric acid titrations. In order to determine the effect of the mucoprotein present in gastric juice upon the titration of hydrochloric acid to the methyl orange end-point, preparations of mucoprotein from gastric juice were made. The method of preparation was based upon the methods given by Levene<sup>(7)</sup> and briefly was as follows:

Bile-free gastric juice was adjusted to pH 4.3 and precipitated with four volumes of absolute alcohol. The flocculent precipitate was centrifuged down and dissolved in a small volume of 0.1 N sodium hydroxide. A small insoluble residue was removed by centrifuging. About twelve volumes of water were added, followed by one drop of methyl orange. The addition of hydrochloric acid until the pH of the solution was 3.5 to 4.0 led to the formation of a flocculent precipitate. It was centrifuged, washed with water of the same pH, then with absolute alcohol and with ether. The precipitate was dried by exhausting the centrifuge tube for some hours at room temperature. After grinding in a mortar, the powder was dried in a desiccator. It resembled the preparations of Webster and Komarov<sup>(20)</sup> in possessing only very slight solubility in neutral or acid solutions and ready solubility in alkali.

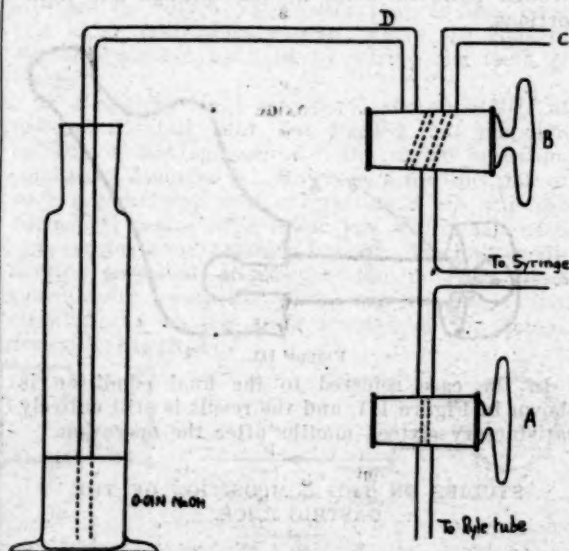


FIGURE 1.  
Diagram of apparatus used for collecting resting juice for estimation of bicarbonate content.

The effect of the mucoprotein preparation upon the titration of hydrochloric acid was tested in the following way.

Uniform suspensions of mucoprotein in approximately N/10 hydrochloric acid were prepared by grinding in a mortar. Titration of two cubic centi-



metre quantities of hydrochloric acid and of the hydrochloric acid suspensions of mucoprotein gave the results in Table I. It appears that the titration

TABLE I.  
Effect of Gastric Juice Mucoprotein upon the Titration of Hydrochloric Acid with Sodium Hydroxide.

Preparation Number.	Mucoprotein Suspension per centum.	Methyl Orange End-Point pH 4.3. Cubic Centimetres of 0.01 N. NaOH.	Phenolphthalein End-Point pH 8.2. Cubic Centimetres of 0.01 N. NaOH.
1	0.70	30.35	21.65
2	0.35	30.35	21.45
3	0.70	30.85	21.85
4	0.55	20.45	21.35
5	0	20.40	—
	(Hydrochloric Acid.)		

of hydrochloric acid with sodium hydroxide is not interfered with by mucoprotein when the end-point chosen is that of methyl orange (pH 4.3); at this point the total hydrochloric acid of the solution may be accurately determined. When the titration is continued to pH 8.2, the suspended mucoprotein dissolves in the added alkali and the difference in the two titration figures is due mainly to the combination of sodium hydroxide and mucoprotein on the alkaline side of its iso-electric point. It will be seen in the subsequent paper that the values for hydrochloric acid in gastric juice found by titrating to the methyl orange end-point indicate very closely the true amount of hydrochloric acid present.

**Sodium.**—Estimations of sodium were made by the method of McCance and Shipp,<sup>(1)</sup> in which sodium is precipitated as the triple salt, sodium zinc uranyl acetate. One cubic centimetre quantities of gastric juice were digested by Bolliger's perchloric acid-hydrogen peroxide method,<sup>(2)</sup> as for the potassium estimation (see below). The easily soluble residue was dissolved in water to an appropriate dilution and the McCance and Shipp procedure applied to two cubic centimetre quantities of this solution. The perchloric acid does not interfere with the method. Much difficulty was encountered in washing the precipitated sodium zinc uranyl acetate with alcohol saturated with the salt. Unless the washing alcohol was prepared from a freshly precipitated sample of the triple acetate, high results were constantly obtained with solution of known sodium content. It was found that the sodium zinc uranyl acetate precipitate could be washed without loss with absolute alcohol at  $-10^{\circ}$  to  $-5^{\circ}$  C. The centrifuge tube containing the precipitate was washed down with three cubic centimetres of the cold alcohol and the precipitate was stirred up with a very fine stirring rod. Usually eight tubes were washed in each batch; the tubes were constantly kept in an alcohol bath at  $-10^{\circ}$  to  $-5^{\circ}$  C. and were centrifuged in cold centrifuge cups immediately after the completion of the stirring up of the precipitates. No other departure was made from the method as published by McCance and Shipp. All estimations were made in quadruplicate in order to minimize the experimental error of the method.

**Potassium.**—Bolliger's method<sup>(2)</sup> was used in the estimation of potassium. Usually one cubic centimetre of gastric juice was digested with 0.1 cubic centimetre of 60% perchloric acid in a "Pyrex" centrifuge tube, digestion being completed by alternately adding a drop of 30% hydrogen peroxide and heating. To estimate potassium, such a digest is extracted with about three cubic centimetres of a mixture of n-butyl alcohol and ethyl acetate. After being centrifuged the liquid is poured off and the tube is allowed to drain. Very gentle heating at first, increased later to vigorous heating of the whole tube, removes ammonium perchlorate and perchloric acid. The resulting potassium perchlorate is dissolved in the minimum quantity of water and the potassium is precipitated by the addition of sufficient saturated solution of tartaric acid in absolute alcohol to bring the alcohol concentration to more than 90%. The precipitated potassium acid tartrate is centrifuged and washed with absolute alcohol. The washed tartrate is dissolved in about three cubic centimetres of water and titrated with 0.01 N sodium hydroxide. This method was found to yield accurate results with the estimation of quantities of potassium as small as 0.5 milligramme or less.

**Ammonia.**—Ammonia was estimated in gastric juice by employing the procedure which Myers<sup>(10)</sup> used for the estimation of the ammonia formed in blood by the action of urease on urea. Usually to two cubic centimetres of gastric juice were added five cubic centimetres of saturated sodium carbonate solution and the ammonia was aerated into dilute acid solution. The ammonia was estimated by Nesslerization and colorimetric comparison with a standard solution containing one milligramme of nitrogen in 250 cubic centimetres. Martin<sup>(8)</sup> found that a similar procedure yielded reliable results, which closely agreed with those obtained from gastric juice which had been deproteinized. The reliability of the method is further supported by the fact that a series of specimens from one patient all showed complete absence of ammonia. Such a result, which also has been observed by others (Strauss,<sup>(17)</sup> Martin<sup>(8)</sup>), indicated that no ammonia is formed during the aeration time from the non-ammoniacal nitrogenous substances present in the gastric juice.

**Calcium.**—Two cubic centimetre quantities of gastric juice were digested by Bolliger's method. The acid digest was dissolved in two cubic centimetres of water. This solution was treated by the method for the micro-titration of calcium which Tisdall and Kramer<sup>(18)</sup> applied to a Stolte ash extract.

**Magnesium.**—The supernatant fluid and washings from the calcium estimation were treated by Brigg's<sup>(8)</sup> method for the estimation of magnesium as magnesium ammonium phosphate, the phosphorus being estimated by the method of Fiske and Subbarow.<sup>(5)</sup>

**Chloride.**—Chloride was estimated in one cubic centimetre quantities of gastric juice by the open Carius method of Van Slyke and Sendroy.<sup>(10)</sup>

**Phosphate.**—Two cubic centimetre quantities of gastric juice were adjusted to approximately pH 4.3 (the acidity of the specimens having previously been determined) and the inorganic phosphate was estimated by the method of Fiske and Subbarow.<sup>(5)</sup>

**Bicarbonate.**—Frequently it has been stated that the so-called alkalinity of gastric mucus is due to the presence of bicarbonate. In order to obtain quantitative information on the point, estimations of the bicarbonate content of the resting juice were made in a number of subjects, using a modification of the titration method of Van Slyke for plasma bicarbonate. Since it was desired to prevent exposure to the air of the gastric fluid while it was being collected, the estimations of bicarbonate were done on specimens obtained by passing a gastric tube into the resting stomach and not upon the specimens obtained with the gastric and duodenal intubation technique. The gastric tube was connected with the simple apparatus sketched in Figure I. Gastric juice was aspirated through tap A, tap B being closed. Tap A was then closed, tap B was turned to communicate with tube C and air in contact with the gastric juice, and most of the gastric juice was expelled and rejected. After further aspiration of gastric juice into the syringe, tap A was closed and tap B turned to communicate with tube D. About ten cubic centimetres of gastric juice were delivered into five cubic centimetres of 0.01 N sodium hydroxide in a small graduated stoppered cylinder which had been calibrated. The volume of fluid was read.

To five cubic centimetres of the resulting specimen was added sufficient 0.01 N hydrochloric acid to neutralize the added 0.01 N sodium hydroxide and the bicarbonate in the specimen was estimated by the titration method of Van Slyke for plasma bicarbonate. The titration was carried to the pH of the original gastric juice in the case of an acid or weakly acid specimens. A slight modification

made it possible to demonstrate the absence of bicarbonate or of carbon dioxide in appreciable amounts from acid specimens. The method was checked with a standard solution of sodium bicarbonate and was found to give accurate results. Specimens showing bile pigments have not been included in this series of tests.

**Urea and Protein.**—In agreement with other observers (for example, Martin<sup>(8)</sup>), urea was found in gastric juice. Since urea estimations were not required in the present investigation, urea plus ammonia were estimated together. The nitrogen thus found was subtracted from the total nitrogen estimated by the method for serum proteins; the difference was taken as protein nitrogen. This is only approximately correct, for Martin has shown that small amounts of non-protein nitrogen other than ammonia and urea nitrogen are present in gastric juice. The results, however, serve well to illustrate the changes in protein nitrogen in a series of specimens of gastric juice.

#### Results.

The results in Table II were obtained from analyses of gastric juice collected both with and without stimulation by histamine. Acidity and total chlorides were estimated in sixty-eight specimens; sodium and potassium in forty-two specimens; calcium, magnesium, ammonium and inorganic phosphorus in twenty-four specimens; protein nitrogen in eleven specimens; and bicarbonate in eight specimens. The results may be taken, therefore, as an indication of the possible composition of the gastric juice (the secretion of the whole stomach) under various conditions. Included in the table are Rosemann's<sup>(15)</sup> analyses of gastric juice obtained by the sham-feeding of dogs, and analyses by Gamble and McIver<sup>(6)</sup> of specimens collected from Heidenhain pouches in cats.

Rosemann found very much less calcium than the analyses by the author and by Gamble and McIver have proved to be present. Similarly with mag-

TABLE II.  
Composition of Gastric Juice of Human Beings compared with the Findings of Rosemann for Dogs (Sham-feeding) and of Gamble and McIver for Cats (Heidenhain Pouch).

Substance.	Human Being. Author's Results.		Dog. Rosemann's Results.		Cat. Results of Gamble and McIver.	
	Highest Results. Gramme per centum.	Lowest Results. Gramme per centum.	Highest Results. Gramme per centum.	Lowest Results. Gramme per centum.	Highest Results. Gramme per centum.	Lowest Results. Gramme per centum.
Total chloride .. .. .	0.570	0.235	0.642	0.543	0.640	0.536
Hydrochloric acid .. .	0.498	0	0.602	0.321	0.544	0.066
Sodium .. .. .	0.270	0.012	0.025	0.020	0.128	0.028
Potassium .. .. .	0.074	0.025	0.043	0.031	0.053	0.045
Bicarbonate as sodium bi- carbonate .. .. .	0.130	0	—	—	—	—
	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.
Calcium .. .. .	8.6	4.1	0.22	0.07	10.6	4.1
Magnesium .. .. .	0.4	2.2	0.53	0.40	—	—
Ammonium .. .. .	20.8	0	22.1	11.8	—	—
Inorganic phosphorus ..	4.2	1.1	0.3	0.3	0.5	0.2
Protein nitrogen .. .	94.0	17.0	—	—	—	—



nesium, which Gamble and McIver did not determine, Rosemann's figures are much smaller than those found for human gastric juice.

Robertson<sup>(14)</sup> states that an analysis of a specimen of gastric juice obtained by Spallanzani in 1783 showed that ammonia was present. Since that date this has been repeatedly confirmed. Strauss<sup>(17)</sup> found that ammonia was absent in two cases out of ten, and later Martin,<sup>(8)</sup> in studying apparently normal stomachs, has found ammonia in quantities varying from a trace to 19.6 milligrammes of ammonia per 100 cubic centimetres of gastric juice. In the results here reported the patient whose gastric juice contained no ammonia was found to maintain this condition both before and after stimulation of gastric secretion by histamine. In all, six specimens were obtained from him and none contained ammonia. It is concluded that, although ammonia is usually present in gastric juice in appreciable quantities, it is absent from the juice of some individuals.

Inorganic phosphorus was found in the twenty-four specimens analysed in quantities considerably greater than those reported by Rosemann and by Gamble and McIver. In both of the latter investigations apparently only two or three analyses for phosphorus were made. Panton and Tidy<sup>(11)</sup> reported the presence of phosphorus in gastric juice in quantities up to 36 milligrammes of phosphorus per 100 cubic centimetres. In the course of the present work two pooled specimens of gastric juice, containing in all twelve separate specimens, were analysed for inorganic phosphorus and total phosphorus by the methods of Fiske and Subbarow. One pooled specimen of high acidity contained 1.15 milligrammes of inorganic phosphorus and 3.75 milligrammes of total phosphorus per 100 cubic centimetres. The other pooled specimen, of very low acidity, contained 3.0 milligrammes of inorganic phosphorus and 8.9 milligrammes of total phosphorus per 100 cubic centimetres. In their results Panton and Tidy regarded the total phosphorus,

which they estimated, as inorganic phosphate, and thus were considering quantities at least three times too great. Also it is very doubtful whether their method of phosphorus estimation can be considered quantitatively accurate. On the basis of these criticisms it seems that their figures cannot be accepted.

The results in Table III give a general indication of the variations in the quantities of the individual constituents of gastric juice before and after stimulation of the stomach by histamine. Total chloride, as well as hydrochloric acid, rises to a maximum after the injection of histamine. The chief constituents of the bases present, sodium and potassium, are seen to vary inversely with one another, the potassium reaching a maximum after the injection of histamine. This relationship has been frequently, but not invariably, noted in the series of tests. Of the minor constituents, calcium, ammonium and inorganic phosphorus are present in minimal amounts some time after the injection of histamine. Then, in later specimens, they are present in quantities approaching those found in the specimens obtained before histamine stimulation. Magnesium, on the other hand, usually occurs in greatest amount in the specimen collected thirty to forty-five minutes after the injection of histamine, that is, at about the time of greatest stimulation. The variations from specimen to specimen in the case of magnesium are more irregular than in the other constituents.

#### Summary.

1. Methods used in making accurate analyses of gastric juice are described.

2. The effect of a preparation of gastric juice mucoprotein upon the titration of a solution of hydrochloric acid has been investigated and its bearing upon the estimation of acidity of gastric juice is considered.

3. Analyses of gastric juice for acidity, total chloride, sodium, potassium, calcium, magnesium, ammonium, inorganic phosphorus, bicarbonate and

TABLE III.  
Showing the Variations in Composition of the Gastric Juice before and after Stimulation of the Stomach by Histamine.

Substance.	Specimen Number.						
	1	2	3	4	5	6	7
	Gramme per centum.	Gramme per centum.	Gramme per centum.	Gramme per centum.	Gramme per centum.	Gramme per centum.	Gramme per centum.
Hydrochloric acid .. ..	0.123	0.967	0.119	0.264	0.296	0.280	0.134
Total chloride .. ..	0.334	0.336	0.358	0.443	0.446	0.459	0.394
Sodium .. ..	0.0775	0.0968	0.0998	0.0567	0.3870	0.0520	0.0692
Potassium .. ..	0.0550	0.0577	0.0623	0.0727	0.0674	0.0592	0.0569
	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.	Milligrammes per centum.
Calcium .. ..	6.3	6.2	6.0	4.1	5.0	4.2	6.0
Magnesium .. ..	2.5	2.2	4.7	3.5	7.4	4.6	5.7
Ammonium .. ..	17.8	20.6	18.0	15.6	13.4	17.7	18.6
Inorganic phosphorus ..	3.8	3.8	4.2	2.1	1.8	1.9	2.1

All specimens were collected in a period of 15 minutes except Number 2, which was collected in 22 minutes. Histamine was injected at the end of collection of specimen Number 2.

protein nitrogen are reported. The results are compared with those of other observers.

4. The variations in the quantities of the constituents of gastric juice collected before and after the injection of histamine are mentioned.

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#### TWO SIMPLE PRECAUTIONS TO PREVENT ACCIDENTS IN THE USE OF LOCAL ANÆSTHETICS.

By A. B. KEITH WATKINS, M.S. (London),  
F.R.C.S. (England), F.R.A.C.S.,

Honorary Ear, Nose and Throat Surgeon, Newcastle Hospital; Cranio-Cervical Surgeon to the Mater Misericordiae Hospital, Waratah, New South Wales.

ALTHOUGH local anæsthesia is generally believed to be very safe, from time to time sequelæ varying from slight unpleasantness up to the loss of the life of the patient occur.

In the majority of cases the serious sequelæ are the result of carelessness in technique.

The most serious results have come from mistaking for those intended for injection, solutions which are intended only for producing anæsthesia by surface application, and the greater risk will be appreciated when one remembers that it is usual in oto-rhino-laryngological work for both these solutions to be in use at the same time, for example, either strong cocaine solution or strong "Percaine" solution for surface application, and "Novocain" or weak "Percaine" solution for injection. The former solutions are so toxic that the injection of a few minims may be fatal and, if the large quantities usually used in injection anæsthesia were injected, nothing short of immediate excision of the part could possibly save the patient. In America, where "Novocain" is termed "Procaine", mistakes from the similarity of the term to cocaine are especially likely to occur.

Even when receptacles of different colours are used, there is always the possibility of the solutions having been placed in the wrong receptacle.

To counteract this, a routine has been made of having all cocaine solutions intended only for surface anæsthesia slightly tinged with methylene blue. When operating, the sight of this colour in the solutions for surface anæsthesia and the absence of it in the other solutions produces great comfort by the confidence it instils.

In practice it has been found that after ten months the colour has not faded in a bottle half full of 10% cocaine hydrochloride solution, nor has the cocaine lost its potency.

Other precautions, such as those for the prevention of injection of anæsthetic solution into a vein, are too well known to require mention.

However, one can find no reference to any simple means by which the isotonicity of the saline can be quickly verified.

If too hypotonic a solution is used, it stings like a lash. If too hypertonic a solution is used, it produces a burning sensation a few seconds after injection, followed by considerable swelling of the parts, lasting for days. This may even produce facial paralysis if the injection is near the ear, and may nearly suffocate a patient if the injection is under the deep cervical fascia. After the use of either hypotonic or hypertonic solutions, if the variation from normal is sufficient and the amounts injected have been great enough, sloughing may occur.

These drastic results occur only when the variation is considerable, and in practice occur when

the theatre staff has made up the anæsthetic solution with the concentrated saline solution used as stock for making normal saline solution, which is usually about twenty times too strong. Here again, care that the solution has been taken from the correct bottle is no criterion that the solution is isotonic, for in the only severe reaction due to hypertonic saline solution in the writer's practice the saline solution was taken from the correct container, but yet analysis showed the residue of the solution in that bottle to contain about twenty times too much salt.

FIGURE 1.  
Urinometer floating  
in isotonic saline.

A quick way of verifying the concentration of saline solution is to take its specific gravity, and the writer now never operates under injection local anæsthesia unless some of the actual saline solution used is in a urinometer jar in a conspicuous place in the theatre with the hydrometer floating in it before and during the operation. Where the saline solution is isotonic the hydrometer rides low, giving a reading of between 1005 and 1009, but where the stock solution twenty times too strong is used, it



rides high with the stalk of the instrument and part of the bulb right out of the solution, indicating a specific gravity of about 1100.

Figures I and II show the marked difference in the hydrometer reading between the normal and the concentrated stock saline solutions.

Since adopting this simple precaution the writer has often come across minor variations, hypertonicity up to about 50%, and this can be corrected by adding sterile water until the hydrometer reading is correct. Before this the writer had the idea that often one could expect slight swelling following injection anaesthesia due to such injection, but since he has been sure that the saline solution used is always isotonic no more swelling has been found to occur than after an operation under general anaesthesia.

Colleagues, some of whom have seen the idea in operation, have supplied information of cases in which patients, on having intravenous saline solutions, complained of a stinging pain shooting up their limb from the site of the injection and who have collapsed and died almost at once. Such stories have now been collected from too wide sources for one to be able to believe that deaths from saline infusion of the wrong concentration have not occurred in a surprising number of cases, and if all those using such treatment would only take the trouble to verify the strength of their solutions by the simple method here advocated, the writer feels sure lives would be saved.

To summarize, deaths from injection of anaesthetic solutions intended only for surface anaesthesia can be avoided by lightly colouring such solutions with methylene blue, and accidents from the use of hypotonic or hypertonic solutions can be avoided by verifying their specific gravity with an ordinary urinometer hydrometer.

#### A NOTE ON THE USE OF JACKSON'S CROSSED CYLINDERS.

By KEVIN O'DAY, M.D., B.S. (Melbourne),  
D.O.M.S. (London),

*Clinical Assistant to the Ophthalmic Surgeon, Saint Vincent's Hospital, Melbourne; Clinical Assistant to the Ophthalmic Surgeon, The Victorian Eye and Ear Hospital.*

As a help in finding the correct axis of the cylinder in the subjective test, the spherocylindrical



FIGURE II.  
Urinometer floating in concentrated stock saline solution (to be diluted with 19 parts of water to make normal saline), demonstrating how obviously it shows if a mistake has been made in the solutions.

combination known as Jackson's "crossed cylinders" is reliable and time-saving.

It usually takes the form of a negative cylinder with a positive sphere of half the power of the

cylinder. A convenient size is  $\frac{+0.25 \text{ sphere}}{-0.50 \text{ cylinder} \downarrow}$  which, as is readily seen, is equivalent to  $\frac{-0.25 \text{ sphere}}{+0.50 \text{ cylinder} \rightarrow}$

or  $\frac{+0.25 \text{ cylinder} \rightarrow}{-0.25 \text{ cylinder} \downarrow}$ . In practice, when working with

a positive cylinder in the trial frame it is convenient to consider the instrument as a positive cylinder and a negative sphere; when working with a negative cylinder, as a negative cylinder and a positive sphere.

The end segments of the cylinders are frosted, a clear square being left in the centre of the glass, the diagonals of which are at an angle of  $45^\circ$  to the axes of the cylinders. The positions of the latter are marked on the ground glass with red and white dots, red denoting the positive one (Figure I). The reverse is the case with American models.



FIGURE I.

The lens is mounted on a long cylindrical handle, the long axis of which is in line with one diagonal of the square. Rotation of the handle round its long axis through an angle of  $180^\circ$  is equivalent to rotating the axes of the crossed cylinders through an angle of  $90^\circ$ . If the instrument be held vertically, the axis of one cylinder will be  $45^\circ$  to the left. Semicircular rotation of the handle will now place the cylinder in a position of  $45^\circ$  to the right.

The principle underlying the use of crossed cylinders in estimating the correct axis of astigmatism, is simple enough. If a cylinder of power  $C_1$  set at an axis  $\alpha$  be combined with a cylinder of power  $C_2$  set at an axis  $\beta$ , the result of the combination will be a sphere of power  $D$  and a cylinder of power  $C_3$  set at an angle  $\phi$ .<sup>(1)</sup> In the case of cylinders of the same sign,  $\phi$  will lie between  $\alpha$  and  $\beta$  (Figure II).

When the instrument is used, a cylinder is applied to a cylinder of the same sign in the trial frame, at an angle of  $45^\circ$  to the left. The effect is that of rotating the latter towards the superimposed one, that is, to the left, and of strengthening it a little.

The spherical component introduced is neutralized by the superimposed sphere of opposite sign. Whilst this is not complete, the small error introduced here, as well as the slight increase in the cylinder, may be ignored. The effect is that of rotating the cylinder in the trial frame towards the crossed cylinder of the same sign. Semicircular rotation of the handle will transfer the crossed cylinder to

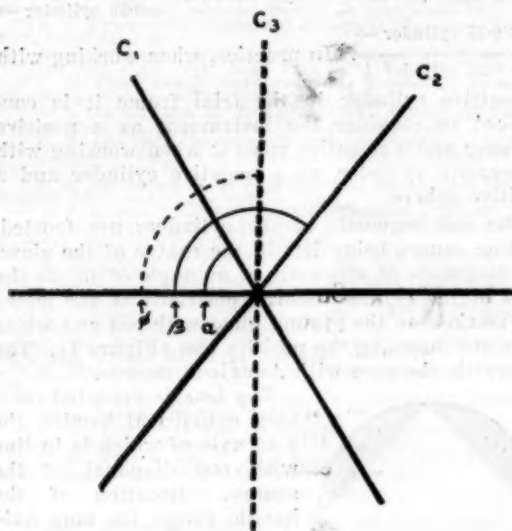


FIGURE II.

an angle of 45° to the right, the effect being to rotate the cylinder in the trial frame to the right. The oculist thus has at his command a method which demonstrates to the patient the difference between two positions of the cylinder. The value of the test lies in the rapidity with which the contrast is offered, and rarely does one receive a contradictory response. If the cylinder be at the correct axis, there will be no difference between the two positions. If it be incorrect, the position which rotates it towards the true axis will appear much better than the other.

The method of application is as follows. The instrument is applied to the cylinder in the trial frame with the diagonal of the square in line with the axis of the cylinder. The crossed cylinders are now at an angle of 45° to the latter. Let us suppose that it is a positive one at an angle of 80° and the positive crossed cylinder lies to the left. The attention of the patient is directed to the lowest line of test types, the instrument is rotated, and he is asked which position he prefers. If it be the first one, the cylinder is rotated a little to the left, to 75° for instance. If it be the second one, it is rotated to the right, to 85°. The process is repeated in the new position, the end-point being reached when no difference is noted between the two positions. If it is passed, the patient at once prefers the opposite position. The rule is to rotate the cylinder in the trial frame in the direction of the

crossed cylinder of the same sign, in the position preferred by the patient.

The effect of the crossed cylinders as used in this manner may be proved mathematically.<sup>(1)</sup> A few experiments with lenses from the trial case will furnish practical proof.

#### Reference.

(1) Percival: "The Prescribing of Spectacles", 1928, page 193.

## Reports of Cases.

### MACROCYTIC HYPOCHROMIC ANÆMIA.

By BRUCE HUNT, M.D. (Melbourne),  
M.R.C.P. (London).

Honorary Physician to Out-Patients, Perth Hospital  
and Children's Hospital, Perth.

ON October 20, 1932, Mrs. A.B., aged fifty-one years, was referred to me by Dr. H. Baldwin Gill for diagnosis and treatment. The patient had consulted Dr. Gill on account of long-standing dysphagia.

At the age of twenty-one and again at thirty-six, after the first and fifth (and last) confinements respectively, severe *post partum* hæmorrhage had occurred. Since the second of these hæmorrhages marked pallor and great weakness had been consistently present. Dyspnoea on the slightest exertion was most distressing. Dysphagia was constant. Attacks of nausea and flatulence occurred frequently. The tongue was commonly dry and sore. Constipation was marked. Severe cramping pains in arms and legs had occurred frequently during recent years. There had been no loss of weight. The menstrual flow had ceased at forty-one years of age.

Examination revealed a thin, but not wasted, middle-aged woman. The skin was lemon yellow in colour; the mucosæ were exceedingly pale. The retinæ were markedly anæmic. The tongue was smooth and dry, but not ulcerated. Dr. Gill reported the throat as pale, but otherwise normal. He also reported mild deafness of otosclerotic origin. The patient was edentulous.

The heart was not enlarged, the apex beat being in the fifth intercostal space 7.5 centimetres (three inches) from the mid-line. The rate at rest was 84. The rhythm was regular. A loud hæmic murmur could be heard all over the precordium. The systolic blood pressure was 120 and the diastolic pressure 80 millimetres of mercury. The lower edge of the liver was palpable 2.5 centimetres (one inch) below the costal margin. The spleen was not palpable. All the deep tendon reflexes were greatly exaggerated; patellar clonus was present, but Babinski's sign was absent and there were no other neurological abnormalities. The urine was chemically and microscopically clear.

The remainder of the findings on physical examination were essentially normal.

The blood picture was as follows:

Erythrocytes, per cubic millimetre	2,200,000
Hæmoglobin value (Sahli)	20%
Size of erythrocytes	8 microns
Leucocytes, per cubic millimetre	3,750

In the film marked anisocytosis of the red cells was found, many macrocytes being present. The red cells stained very poorly, many of the macrocytes being merely "shadow cells" (this provides an explanation for the combination of macrocytosis and hypochromia). Moderate poikilocytosis was present. There was very little polychromasia. No nucleated red cells were seen.

The differential leucocyte count was as follows: Polymorphonuclear cells, 60%; small lymphocytes, 36%; monocytes, 4%.

The gastric contents removed one hour after an Ewald meal contained no free hydrochloric acid.



TABLE I.

Date.	Treatment Ordered.	Hæmoglobin Value (Sahli).	Erythrocytes per Cubic Millimetre.	Size of Erythrocytes (Microns).	Leucocytes per Cubic Millimetre.	Remarks.
4.11.32		%				
7.11.32	<i>Ferri et Ammonii Citrus</i> , 7.2 grammes (120 grains) daily. Liver, half pound daily.	27.0	2,100,000	8.2	3,700	
14.11.32	<i>Ferri et Ammonii Citrus</i> , 7.2 grammes (120 grains) daily. Liver, half pound daily.	48.0	3,000,000	7.8	3,550	Obvious clinical improvement.
21.11.32	<i>Ferri et Ammonii Citrus</i> , 7.2 grammes (120 grains) daily. Liver omitted.	52.0	3,350,000	8.0	3,850	
5.12.32	<i>Ferri et Ammonii Citrus</i> , 7.2 grammes (120 grains) daily. Liver omitted.	65.0	3,600,000	8.2	2,750	
29.12.32	<i>Ferri et Ammonii Citrus</i> , 5.4 grammes (90 grains) daily.	75.0	4,900,000	8.0	4,300	
9.2.33	<i>Ferri et Ammonii Citrus</i> , 2.4 grammes (40 grains) daily.	86.0	5,650,000	7.48	3,650	A normal menstrual period was observed in January (after ten years of amenorrhœa); this did not occur again.
1.7.33	<i>Ferri et Ammonii Citrus</i> 1.8 grammes (30 grains) daily.	Patient not seen.				
1.8.33	Nil.	Patient not seen.				
1.11.33	Nil.	100.0	4,800,000	7.32	3,550	Obviously perfectly well.

Except for the comparatively high erythrocyte count, the clinical picture was one of Addisonian anæmia. It was felt, however, that one was more probably dealing with the Plummer-Vinson syndrome, but in view of the mixed hæmatological picture it was decided to give a short therapeutic trial of liver extract and to observe the reticulocyte response. Between October 22, 1932, and November 4, 1932, five cubic centimetres of "Hepatex" (P.A.F.) was injected intramuscularly on five separate occasions with little or no effect; the reticulocyte count, which was performed daily, never rose beyond 2%. On November 4, 1932, the hæmoglobin had slightly increased, but the blood picture was essentially unchanged. The erythrocytes numbered 2,200,000 per cubic millimetre. The hæmoglobin value was 27%. The size of the erythrocytes was 8.2 microns. The leucocytes numbered 2,700 per cubic millimetre.

On November 7, 1932, the stomach contents were again shown to contain no free hydrochloric acid. Intramuscular injection of four cubic centimetres of a 1% aqueous solution of neutral red, however, imparted a definite pink coloration to the gastric contents within fifty minutes, indicating that the achlorhydria was not part of a true *achylia gastrica*. This substitute for the histamine test is just as effective and is often less distressing to the patient.

On November 7, 1932, the anæmia now being established as secondary rather than primary in type, iron therapy was commenced. The results are shown in Table I.

#### Summary.

A case of hypochromic anæmia with dysphagia (Plummer-Vinson syndrome) clinically resembling Addisonian anæmia is reported. The following hæmatological features are of interest: (i) Macrocytosis, persisting until the blood picture was practically normal, (ii) persistent leucopenia, (iii) maintenance of clinical improvement despite cessation of treatment.

#### TRAUMATIC RUPTURE OF THE SPLEEN.

By THOMAS HAMILTON, M.B., Ch.M., F.R.A.C.S., F.A.C.S.,  
Honorary Assistant Surgeon, Newcastle Hospital.

Rupture of the spleen is a not uncommon complication of road and other accidents in modern civilian life. The most frequent cause is the passage of a wheel over the trunk of the body. Injury to the other organs, such as lungs, liver and intestines may accompany the rupture of the spleen.

The mortality from multiple internal injuries of this type is extremely high, but, when the spleen is the

only organ involved, careful and immediate treatment offers the patient a fair chance of recovery.

Treatment varies from masterly inactivity, coupled with close observation and general nursing treatment for shock, to immediate laparotomy and splenectomy.

#### Clinical History.

The following case notes concern a girl, aged seven, who successfully recovered after forty-eight hours' observation, followed by laparotomy and packing of a tear in the spleen with gauze.

B.M. was admitted at 10.30 a.m. on October 24, 1933, to the Newcastle Hospital, with a history of having been run over by a motor car. She was pale, restless, thirsty and complained of abdominal pain. Abrasions to the left forearm and hand and also to the left side of the thorax were noted. Tenderness was present in the left hypochondrium and a "guarding" of the abdominal musculature in the same region noticed on palpation. There was a doubtful dullness to percussion in both flanks, but no shifting dullness was detected. One hour after admission the child complained of pain on the top of the left shoulder.

She was diagnosed as suffering from severe shock with a possible rupture of the spleen. It was decided to treat the shock by the usual measures and to await confirmatory evidence of splenic injury.

On the following day her condition was much improved and the muscular rigidity had almost disappeared, although tenderness was still present in the left hypochondrium. Next morning, however, the improvement of the day previous was not maintained. Dullness was definitely present in the flanks and shifting dullness was detected. The patient commenced vomiting, complained of severe abdominal pain and her general condition quickly became critical. It was decided to delay operation no longer.

When brought to the theatre, she was in a state of semi-collapse. A longitudinal incision was made through the upper left rectus muscle, and on opening the peritoneum a fair amount of fresh blood welled forth. The spleen was sought and a wide linear tear about 5.0 centimetres (two inches) long located on its costal surface. As the tear was bleeding freely and the spleen strongly adherent to the diaphragm posteriorly it was considered that time and the girl's condition would not permit of an involved splenectomy. Accordingly, a length of gauze, 5.0 centimetres (two inches) wide, was smeared with liquid paraffin and packed tightly into and around the rent in the spleen, the free end of the gauze being brought out through a rubber tube in the abdominal wound. The latter wound was rapidly closed and the patient was returned to the ward. Post-operative treatment included the administration of morphine to allay restlessness and abundant fluids by mouth and *per rectum*. "Coagulen, Ciba" was also given every four hours for four doses.

Three days after operation portion of the gauze was gently pulled out of the wound and on the fifth day the rubber tubing and gauze were completely removed.

The patient recovered well and the abdominal wound healed slowly but completely, no deep sepsis or peritonitis having supervened. The only post-operative complication was a rather severe attack of bronchopneumonia which the patient was able to overcome, being discharged from hospital on December 9 in good health.

#### Comment.

Packing of a tear in a ruptured spleen is a somewhat risky expedient in comparison with splenectomy, but, if successful in a desperate case, as quoted above, is well justified as a life-saving measure. The dangers, of course, are further uncontrolled hæmorrhage and also peritonitis.

The smearing of the gauze, used in packing, with liquid paraffin was a device to facilitate its easy removal and at the same time minimise hæmorrhage.

#### Acknowledgement.

I am indebted to my house-surgeon, Dr. Carlyle Hudson, for his careful attention to the after-treatment of the patient.

### DEATH FROM ANAPHYLAXIS.

By J. G. SLEEMAN, M.D. (Adelaide),  
Medical Superintendent, Adelaide Hospital.

EDWARD S., aged twenty years, formerly a dairy hand, but latterly unemployed, presented himself at the casualty room for treatment at 3.45 p.m. on October 1, 1933. He stated that he had that morning, while cutting grass, run the point of a sickle through his boot into his foot.

He was a healthy looking young adult, spare in build, but otherwise normal. His past history (which was only subsequently elicited) was that he had from time to time suffered from attacks of asthma.

Examination of the foot revealed a shallow wound of the left toe. This wound was then infiltrated with a 2% solution of "Novocain", the wound was enlarged, and the foot was placed in a hot saline bath. He was given 500 units of concentrated antitetanic serum (Commonwealth Serum Laboratory) into the muscle of the arm. Five minutes after the serum injection, he complained of faintness and was unable to lie down on account of some difficulty in breathing. His colour at this time was greyish, but soon assumed a cyanotic tint. He was given ten minims of adrenaline one in 1,000 intramuscularly, but as no improvement became manifest, a vein in the bend of the left elbow was opened. His breathing grew more distressed and laboured, resembling asthmatic respiration, his colour became more greyish-blue and his pulse weak. Fifteen minims of adrenaline were then injected into the cardiac muscle without result. Oxygen was administered through a nasal catheter; a further injection of adrenaline was followed by a cubic centimetre of pituitrin. His pulse improved temporarily, but his respiration became slower and more laboured, and he died half an hour after the injection of serum. Artificial respiration was commenced, but was unavailing.

A *post mortem* examination was carried out on the following day, and the report is as follows:

#### Nutrition.—Spare.

**Lungs.**—Both lungs were voluminous and showed the rib markings plainly. Small hæmorrhages were present under the pleura, particularly in the interlobar fissures, where many emphysematous blebs the size of the little finger nail were also seen. The trachea and larger bronchial tubes were congested, but no excess of mucus was seen. The mouths of the smaller bronchioles, however, were plugged with yellow viscid mucus. No lesion was found in the lung apart from those described.

**Heart.**—The muscle substance of the heart was firm and of good colour; the valves were healthy; the coronary orifices were patent; atheroma was present in slight degree in the basal portion of the aorta.

**Brain.**—The vessels of the brain were dilated over the cortex and many small subarachnoid hæmorrhages were found; no gross lesions could be discovered.

**Other Organs.**—The liver, spleen, kidneys, pancreas, testes, suprarenals, intestines, showed no abnormality.

**Thymus.**—No trace of a thymus could be seen, and the lymphatic glands generally showed no enlargement.

#### Comment.

The suddenness of the onset of symptoms, the nature of these symptoms, the early death and the *post mortem* appearances suggest beyond doubt that death was due to anaphylaxis, and the case is reported not on account of its rarity, but in order to demonstrate the tragic train of events that may follow the carrying out of a procedure which, although done with impunity on thousands of occasions, will in one isolated case result in the death of the patient. Statistics as to the frequency of anaphylaxis following the injection of horse serum vary, but the writer has seen 20,000 such injections made in the course of casualty work, without any untoward results. Park gives the frequency as one in 50,000. Other writers give different percentages. The condition, however, is so rare in comparison with the wholesale use of horse serum that it is almost impossible to compute the frequency of its occurrence. It is depressing to note that all the restorative measures, including the liberal use of adrenaline, were unavailing; it is to be regretted that atropine was not tried.

It is almost impossible in the course of heavy casualty work, to refrain from taking an occasional risk. The number of street wounds that are injected with tetanus bacilli and the fatal nature of established tetanus, make it necessary to administer antitetanic serum to all and sundry, normal and allergic. Lack of time precludes the investigation of all cases for evidence of protein sensitization, but the history of asthma, urticaria and allied manifestations may suggest the advisability of admitting the patient to hospital, where he can be tested for sensitiveness, and if necessary, desensitized. In so far as work with experimental animals has demonstrated that an injection of atropine prior to the administration of serum to sensitized animals will prevent the onset of anaphylaxis, it would seem reasonable to subject patients to the same preliminary medication. The dose sufficient to prevent anaphylaxis in the human being is, however, unknown, and where in casualty work one is concerned with the adequate treatment of emergencies in such a fashion as to avoid the admission of the patient to the wards of the hospital, the administration of such a quantity of atropine as to interfere with vision and to produce other objectionable symptoms would certainly defeat this object and necessitate the admission of the patient. It therefore appears that if any doubt exists as to the sensitization of a patient to foreign protein, it is wiser to admit him to hospital in order that the presence of sensitization may be determined, and, if necessary, desensitization carried out.

### Reviews.

#### CHRONIC NEPHRITIS AND LEAD POISONING.

DR. L. J. J. NYE has published a book on chronic nephritis and lead poisoning in Queensland.<sup>1</sup> Most readers of this journal are well acquainted with his views. He maintains that more people die of chronic nephritis in Queensland before the age of forty than in other Australian States or New Zealand, basing this statement on vital statistics. He surveys and records particulars of 186 patients with chronic interstitial nephritis; six patients under ten years and 64 under twenty years of age suffered from this complaint; an unusual proportion of young people. He further notes that in ten years there were 428 patients whose condition was diagnosed and who were treated for plumbism at the Brisbane Children's Hospital, compared with four such patients in the same period at the Children's Hospital in Sydney. Lead carbonate, used in white lead paint, is

<sup>1</sup> "Chronic Nephritis and Lead Poisoning", by L. J. J. Nye, M.B., Ch.M.: 1933. Australia: Angus and Robertson, Limited. Demy 8vo., pp. 163, with illustrations. Price: 12s. 6d. net.



highly toxic, and has been widely used on veranda railings and fences in Queensland; the hot sun dries this paint to a white powder, and the children are held to touch or rub this paint over long periods, and then by biting their nails, to ingest the powdered lead carbonate. Of the 428 children who suffered from plumbism, 122 were said to have shown major signs of that disorder. The histories of twenty patients, given in some detail, show a high proportion who suffered from severe symptoms, such as wrist drop and foot drop, in childhood.

The morbid anatomy of the kidneys is described, but unfortunately no account is given of the histories of the patients whose kidneys are described. Nor is any indication given of the frequency or severity of basophile degeneration of the red blood cells in the patients under review. Further, although lead is said to have been present in the urine of many patients, no actual record of the methods used or the amount of lead found in any particular patients is given. These omissions may cause comment among the opponents of the view advanced. Nevertheless some explanation must be sought for the apparent prevalence of plumbism among children attending the Brisbane Children's Hospital, and for the high proportion of chronic nephritis among young people in Queensland.

Reference is made to a report issued by Federal authorities which appears to support the views advanced in this book. The book is well set out and clearly printed; the graphs, statistics and case records are informative, and the arguments are easy to follow, though, as the author suggests, not all are equally convincing. The X ray picture of the tibia to face page 60, for instance, is similar to those frequently seen elsewhere, and is not necessarily indicative of plumbism nor of chronic nephritis.

Dr. Nye has made out a very good case and even those who do not hold with him will be bound to agree that the problem is worthy of thorough investigation. If, as is suggested, the conditions still prevail, an investigation of the blood of a large number of selected children attending the Brisbane Children's Hospital, with special reference to basophile degeneration of the red cells, should yield results that will convince the sceptical. It is suggested that paints other than those containing a high proportion of lead should be used in Queensland; in this, the opposition not only of the manufacturers of lead paint, which is hinted at, but of nearly all users of lead paint, would have to be overcome, for the view is widely held that paint affords protection to the surface to which it is applied, in direct proportion to the amount of lead it contains. But, if lead paint causes disease, its use should be prohibited.

#### TUBERCULOSIS.

"TUBERCULOSIS, ITS CURE AND PREVENTION" is a sincere and enthusiastic plea for the adoption of modern scientific knowledge in the campaign against consumption and other forms of tuberculosis.<sup>1</sup> The author thoroughly appreciates the need for early diagnosis by X ray examination and injection of tuberculin, for a pure milk supply, for clinics in which to treat the vast number of sufferers from pulmonary tuberculosis for whom there is no room in sanatoria, and the danger to children of untreated and uninstructed consumptives in their midst. He is perhaps unduly pessimistic as to the possibility of recovery after tubercle bacilli have once appeared in the sputum.

He has been a diligent reader and quotes authorities, as Calmette, Robert Philip, Camac Wilkinson, Stanley Griffith, Krause and Fishberg at great length—some of the quotations extend to ten or fifteen pages—but he does not show evidence of much experience in the use of tuberculin, which he praises so highly, nor in the knowledge of the arithmetic necessary to gauge the smoothly progressing doses; indeed, practical directions are scanty throughout.

The book is frankly addressed to the lay reader as well as to the medical profession and to the former it should

be useful and instructive, several chapters, especially the fourth on incipient consumption, being very good, but the construction is loose, the meaning is not always clearly expressed, and there is an annoying recurrence of unseemly attacks on the alleged ignorance and lack of goodwill to the public of the medical profession.

The plate showing in colours the various degrees of reaction after an intracutaneous injection of tuberculin is beautifully produced; the book has an index, and the misprints are few; the paper is good, and the printing clear.

#### PULMONARY TUBERCULOSIS.

"PULMONARY TUBERCULOSIS IN GENERAL PRACTICE", by Andrew Morland, although only a pocket edition, is full of detail and supplies the student and general practitioner with the necessary information of dealing with tuberculosis in general practice.<sup>2</sup>

Attention is drawn to the difference between the reaction yielded by animals inoculated with tubercle bacilli and the reaction that occurs when human infection takes place; the essential difference between infection and disease is also stressed. While the author makes light of the risk of infection from massed infection in adults, he lays full stress on the importance of bad environment and lowered personal immunity as the main factors in adult infection.

The chapters on symptoms, physical signs and the value of X rays in diagnosis are clearly dealt with, and a few remarks are made on some of the usual complications. General treatment is along sanatorium lines, the necessity of rest, how to decide the amount required and its duration, importance being laid on the pulse, temperature, and X ray findings. Proper nutrition, fresh air and controlled exercise are, of course, not overlooked.

Climate is unimportant, but a well drained soil is preferable to a clay soil.

Symptomatic treatment is shortly dealt with, but collapse of the lung is fully and clearly described.

This little book is well arranged, covers most of the varied phases of pulmonary tuberculosis, and while not giving too much, supplies to the general practitioner just the information he will often require.

#### THE CONTROL OF TUBERCULOSIS.

DR. B. GOLDBERG's book on the control of tuberculosis, as its name suggests, deals extensively and intensively with various methods, procedures, and institutions that are or should be employed by a modern public health organization in its campaign against tuberculosis.<sup>3</sup> The author writes from his wide experience as Medical Director of the City of Chicago Municipal Tuberculosis Organization.

Essentially American in its outlook, there is much food for thought in this volume of nearly 450 pages, and public health administrators will be repaid for their perusal, though they may and probably will disagree with some of the author's dogmatic dicta.

This book is divided broadly into three sections. The first deals with general organization, legislation and education in matters of tuberculosis. Full details are given of the author's conception of the ideal dispensary (this is an obsolescent word which might well have been discarded), with its layout, personnel, and associated activities, such as preventoria and school services.

The second section, a short one, discusses home treatment, which the author rightly insists, is the most important of all. Sanatoria are only for the few, and most cases, at least for part of their illness are treated at their homes. In this "field" treatment, properly developed, lies great hope for the future, and Dr. Goldberg

<sup>1</sup> "Tuberculosis: Its Cure and Prevention", by G. Tippet, M.B.: 1932. London: Methuen and Company, Limited. Crown 8vo., pp. 253. Price: 7s. 6d. net.

<sup>2</sup> "Pocket Monographs on Practical Medicine: Pulmonary Tuberculosis in General Practice", by A. Morland, M.D., M.R.C.P.: 1932. London: John Bale, Sons and Danielsson, Limited. Foolscap 8vo., pp. 119. Price: 2s. 6d. net.

<sup>3</sup> "Procedures in Tuberculosis Control for the Dispensary, Home and Sanatorium", by B. Goldberg, M.D., F.A.C.P., F.A.P.H.A., with a Chapter on Sanatorium Planning by T. B. Kidner, and Introduction by D. J. Davis, M.D., Ph.D.: 1933. Philadelphia: F. A. Davis Company. Royal 8vo., pp. 373, with 54 illustrations. Price: \$4.00 net.

is on sound ground in emphasizing the possibilities of this aspect of tuberculosis control.

The third and longest section is devoted to the sanatorium. Let us see what is the author's conception of its function:

The Sanatorium is becoming an active rather than a passive institution, an institution in which everything that is possible is done in the interest of the patient. We are taking the sanatorium from its position of isolation and seclusion and placing it in closer alignment with the modern hospital and with the field organization. The sanatorium is no longer a unit in itself; it is merely a part of the tuberculosis organization. It is no longer a boarding-house or a refuge for a comparatively few chronic cases. It is a scientific institution designed primarily to serve the community, to serve the many rather than the few, and to promote the greatest good for the greatest number.

Building on this, he gives a complete analysis of a modern, albeit ideal, sanatorium, its planning, its personnel, its exact function and detailed daily routine, its surgical and dental departments, its divisions of laboratories and research, its public health and undergraduate educative aspects, its economic and housekeeping sides, its capacity and its intimate relationship with the general hospital—all these are reviewed in turn, with meticulous detail and thoroughness. How far short of this ideal are our sanatoria!

There are many illustrations of forms and cards used by the Chicago Tuberculosis Organizations, and plans of dispensaries and sanatoria. These should be valuable to those who have entrusted to them the drawing up of schemes for tuberculosis control. Altogether, this book is a mine of information on the subject with which it deals. It can be commended to the attention of all persons, medical or lay, who are interested in tuberculosis. It should at least find a place, as a standard work of reference, in every public health and sanatorium library.

#### RADIOLOGY OF THE DIGESTIVE TRACT.

RADIOLOGICAL investigation by means of the opaque meal and clysmas has developed into a highly specialized art, the guiding principles of which are admirably expounded by Dr. Barclay in his recently published book on "The Digestive Tract".<sup>1</sup>

Apart from the technical demonstration of the various manifestations and appearances that can arise in the different parts of the tract, the whole question of their interpretation and evaluation is fraught with difficulty. Here perhaps more than anywhere else in the whole range of radiology does one realize how essentially this branch of medicine has become and must remain a specialty.

Not only has it developed with extraordinary rapidity, but, as Dr. Barclay points out, it started in the wrong way by the study of the pathological before that of the normal and was handicapped still further by a host of physiological and other misconceptions that had been taught for generations.

Only latterly has the study of the normal been taken up seriously and perhaps the most valuable portion of Dr. Barclay's contribution is the section on the anatomy and physiology of the alimentary tract. As he himself states, the diagnosis of the abnormal can only be based on the sure recognition of the normal and an appreciation of the limits of normality. And he goes on to demonstrate from the examination of many "normal" students and others how "ptosis", "the mobile proximal colon", even "stasis" and "constipation", are frequently well within normal limits; in fact, that the anatomy of the abdomen is so far from being a fixed quantity as to deserve the term "fluid", "as indicative of the extraordinary elasticity of Nature's mechanics". In particular he sounds a note of caution about rushing in with the diagnosis of gastritis

based on the more or less recently introduced methods of investigation of the mucosal pattern, before the normal variations of the latter have been fully studied.

The earlier chapters deal with the precautions that should surround radiological work in general. This discussion, like the rest of the book, is illuminated by knowledge, profound commonsense and an unusual grace and charm of presentation. It recapitulates much that the author has already published elsewhere, representing therefore his considered opinion. It will be found most reassuring to all practitioners and others dealing with X rays and should go far to allay the many fears and bogeys that have surrounded and beset the practice of radiology.

The later sections of the book are concerned with the radiological evidence of disease. This part will perhaps be found slightly disappointing to the more experienced radiologists, as not dealing fully enough with the problems of differential diagnosis. For the beginner, however, it is full of sound guidance.

A chapter on the gall-bladder is included, written in collaboration with Dr. L. A. Rowden.

Useful appendices are added, dealing with such matters as the organization and equipment of X ray departments, the international recommendations for X ray and radium protection, and an assessment of the safety limits of exposure in röntgenography and röntgenoscopy.

Altogether the treatise is a contribution of great value to the practice of radiology.

Dr. Barclay stresses the necessity for gastro-intestinal investigation being in the hands of experienced radiologists. We should like to add the further condition that no radiologist should go on doing such work without having read Dr. Barclay's book.

#### OBSTETRICS AND GYNÆCOLOGY.

THE "Combined Textbook of Obstetrics and Gynaecology" is an authoritative statement of the subjects by J. M. Munro Kerr, J. Haig Ferguson, James Young and James Hendry, and has been brought up to date in this, its second edition. It covers the whole of both subjects and is essentially a sound volume for students and practitioners alike.

The first section is devoted to obstetrics, and contains some excellent chapters, tetany and chorea being particularly well discussed.

To a somewhat captious critic it seems an omission not to mention *belladonna* in the treatment of *pyalism*; also the traditional classification of *hyperemesis gravidarum* into toxic and neurotic groups has been perpetuated. It is not explained why pregnant women should become neurotic and why the neurosis should so invariably take the form of vomiting. The authors say: "It is interesting to observe how suddenly the transfer from the apparently neurotic to the true toxic type occurs. The patient may present a fairly healthy appearance apart from the fact that she retches whenever she has even a drink of water; then within forty-eight hours she may show progressive emaciation, shrinking of the skin and jaundice."

In the conduct of labour it is advised to examine *per vaginam* when the membranes rupture, and this is possibly sound teaching, notwithstanding the protagonists of the rectal method.

Rubin's and the lipiodol tests are well described and it is pleasing to note that great caution in their use is advised. There has been too much haphazard use made of these two methods, and they can be very dangerous.

It is clearly and reasonably laid down that the time to operate on an ectopic gestation is at once, and this is worth mentioning as the question is sometimes debated.

The chapters on operative procedures are somewhat short and too limited to be of much service other than to students.

"Combined Text-book of Obstetrics and Gynaecology for Students and Medical Practitioners", by J. M. M. Kerr, M.D., F.R.F.P. and S. F.C.O.G., J. H. Ferguson, M.D., LL.D., F.R.C.S., F.R.C.P., F.C.O.G., F.R.S., J. Young, M.D., F.R.C.S., F.C.O.G., and J. Hendry, M.A., B.Sc., M.B., F.R.F.P. and S. F.C.O.G.; Second Edition: 1933. Edinburgh: E. and S. Livingstone. Royal 8vo., pp. 1112, with 497 illustrations. Price: 35s. net.

<sup>1</sup> "The Digestive Tract: A Radiological Study of its Anatomy, Physiology and Pathology", by A. E. Barclay, O.B.E., M.A., M.D., D.M.R.E.; 1933. London: Cambridge University Press. Crown 4to., pp. 423, with illustrations. Price: 36s. net.



## The Medical Journal of Australia

SATURDAY, MARCH 31, 1934.

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### ROMANCE AND THE STUDY OF MEDICINE.

THE word romance means different things to different people. To the *littérateur* it recalls writings in the Romance languages, and it carries him through the mediæval romance verse to the later romances connected with the history of the novel. To musicians the word is connected with compositions in an epic-lyrical style, either vocal or instrumental, while the love-lorn maiden connects it with the advent of some *preux chevalier*. The average man or woman finds romance in happenings more or less remote from the daily round of life. To everyone it is a fascination. Romance may come as an unbidden guest; it may have to be sought. But, sought or not, it will prove a source of wonder only to those with a lively power of imagination. There is romance in the lives of most people, even though they may seem to pass their days in monotony. The Psalmist was surely in sorry mood when he wrote:

A thousand years . . . are as a sleep: in the morning they are like grass which groweth up. In the morning it flourisheth and groweth up; in the evening it is cut down,

and withereth . . . We spend our years as a tale that is told. The days of our years are three score years and ten; and if by reason of strength they be fourscore years, yet is their strength labour and sorrow; for it is soon cut off, and we fly away.

Some people cannot find romance because their lot is cast in hard and sordid surroundings that admit of little variation. They must be distinguished sharply from those who fail to find it because they do not look for it. The lives of medical practitioners are full of romance if they will but see it; and they will find it more readily if they will pay heed to the history of their heritage.

It is a commonplace to talk of the romance of medicine. Its history is full of all the elements on which romance may be built. The hopes and aspirations, the doubts and fears, the struggles, the brilliant successes and sometimes the magnificent failures of those in its chief rôles are unsurpassed and possibly without peer in any other activity of man. Pathos and humour, triumph and tragedy are so intermingled and are so real that they are at once as thrilling and inspiring as any drama evolved in the human mind. From time to time the exploits of the giants in medicine have been recounted and their praises have been sung. On the present occasion we wish to recall the work of Wilhelm Konrad Röntgen in the light of a book that has recently been published by Otto Glasser, of the Cleveland Clinic Foundation.<sup>1</sup> There is no need to dwell on the life of Röntgen. It was the life of a seeker after truth who followed the light where it seemed to lead him. Passing from one branch of what to many people is an arid and ungrateful subject, he applied each new fact to what he already knew, and he astounded the medical and scientific world when in 1896 he announced his discovery of X rays to a meeting of medical practitioners at Würzburg. In Glasser's book there is a most interesting chapter of personal reminiscences of Röntgen by Margaret Boveri, of Berlin. It is a pleasing complement to the account of Röntgen's scientific work as set out by Glasser, and reveals the human side of one who must be

<sup>1</sup> "Wilhelm Conrad Röntgen and the Early History of the Roentgen Rays", by O. Glasser, with a chapter by M. Boveri; 1933. London: John Bale, Sons and Danielsson, Limited. Crown 4to., pp. 494, with illustrations. Price: 32s. 6d. net.

accounted great. This book is recommended to those who would study the romance of radiology, and it is unnecessary to state that no medical practitioner should undertake to study radiology before he knows something about the life of Röntgen. Although it was Röntgen who discovered X rays as we know them today, the romance of radiology really began with Crookes, Hittorff and Geissler, who produced vacuum tubes through which electric currents could be discharged, and who had shown that the physical phenomena in connexion with these electric discharges needed further investigation. Röntgen lived to see great progress made in the use of X rays. When he died in 1923, radiologists the world over had carried on the work that he started so brilliantly. No reference, however brief, of the romance of radiology can be made without mention of the many workers who suffered from the injurious effects of the rays that were at first unknown. Radiology has been of untold benefit to humanity, but its story is marked by tragedy and heroism; the story is by no means finished. Every new lesion that is discovered or differentiated by its aid, every new therapeutic triumph that can be placed to its credit, every new diagnostic method of which it is a part carries on this fascinating history.

Although the medical practitioner knows that romance is to be found in everyday affairs, and though he realizes that the history of medicine is full of romance, he should not be content with this knowledge alone. He should set out on a voyage of historical discovery. He will find that each new exploration will give him insight where there was darkness, and satisfaction where there was incertitude. If he is interested in radiology, let him start by reading Glasser's book on Röntgen; if some other branch of medicine claims his attention, he will easily find books that will fascinate and enlighten him. The start should, of course, be made in undergraduate days. It is the teacher in medicine who should inculcate in his students the historical approach to a subject. Once the feet are placed on the right path, and once the face is set in the right direction, there will be little temptation to turn backwards.

## Current Comment.

### LOBAR PNEUMONIA.

PNEUMONIA is one of the common diseases; moreover, it is one of the most important, for it ranks among the most lethal of all infections. Even in the more central spans of adult life it carries a high mortality in its train, and, quite apart from this, its morbidity also is of a high order, accounting for much invalidity and economic loss. It is therefore not surprising that the subject of lobar pneumonia was selected for several contributions during the last annual session of the American Medical Association; more significant is the fact that these papers were read before the Section for Preventive and Industrial Medicine. W. G. Smillie has studied the specific strains of pneumococci found in the naso-pharynx of immediate family contacts.<sup>1</sup> Complementary to this is the study of W. D. Sutliff and M. Finland, who have contributed a summary of the work they have done over a period of three years in identifying the so-called higher types of pneumococci found in a large series of cases of pneumonia.<sup>2</sup> The survey of these authors indicates that pneumonia may be due to a number of organisms, including the hæmolytic streptococcus, the staphylococcus, Friedländer's bacillus, and the various pneumococci. As regards the last mentioned, the type of pneumococcus found in the sputum was a reliable indication of that responsible for the infection. Not only the lobar pneumonias were investigated, but also the vaguer broncho-pneumonic infections. In the latter it was found that the commonest serological type was Type III, and after that various members of the less common varieties, whereas the lobar type of disease was most frequently due to Types I, II, and III, in that order, and then members of the so-called Group IV. This last-named group of pneumococci has been the subject of a great deal of work. As is well known, the most important clinical varieties are Types I and II; these are most commonly responsible for the ordinary lobar pneumonia and produce antibodies of sufficient potency to be of use in the treatment of the disease. Type III is also of great importance, for it causes a serious grade of infection, but does not produce a good immune response either in the infected person or the experimental animal. Therefore, the Type I and Type II antisera are alone of practical value. Type III has been found to be a very common inhabitant of the naso-pharynx of contacts and controls in the general population; Types I and II were uncommon in the general population, though much more frequent among actual contacts. These results have been generally confirmed by other workers, though the types of pneumococci vary in distribution year by year. Overcrowding house conditions, so far as

<sup>1</sup> *The Journal of the American Medical Association*, October 21, 1933.

<sup>2</sup> *Ibidem*.



could be determined, did not appear to influence the distribution of the organisms. The important point emerging from this work is that Types I and II pneumococci (the commonest causes of lobar pneumonia) are much more commonly found in the naso-pharynx of actual contacts than of other members of the community. Whether this is due to infection from the person ill with the disease or whether he is simultaneously infected together with other members of the household, but alone has the misfortune to contract pneumonia, is not known. As regards Type IV, this was the generic title for an apparently heterogeneous group of organisms, but later workers, including the present authors quoted, have established that there is a very large number of serologically distinct types included in this group; the details of this are chiefly of interest to bacteriologists.

Arising out of such studies as these comes next the question of how this knowledge affects treatment. R. Heffron and G. W. Anderson set out the results of an inquiry made by the Massachusetts Department of Public Health into the value of serum treatment of pneumonia.<sup>1</sup> Through the valuable cooperation of several bodies interested, adequate facilities for typing were provided over the two-year period of study. The State Laboratory furnished diagnostic sera for the so-called "higher" types (for example, Type IV in detail), which were differentiated into over thirty recognized strains. The clinical trial of the serum was made by sixty-three selected physicians in fifteen areas. These physicians included not only those on the staffs of large hospitals, but also those sufficiently experienced both in ward and home practice. It should be specially noted that the Harvard School of Post-Graduate Medical Education has on several occasions organized a special one-day course on pneumonia; this must have furthered the cause of the research considerably. The collaborating physicians were available for consultation with any practitioner wishing to use the serum, and where the patient could not afford a consultation fee, this was paid from a grant from the Commonwealth Fund of New York City. In no instance was serum treatment begun later than the fourth day of the disease, but the serum was administered in suitable cases as soon as the clinical diagnosis was made, without waiting for the report of the sputum examination. As more than half of the cases of lobar pneumonia in young persons are due to Types I and II, this plan was fully justified by the time thus saved, though the serum used, Felton's concentrated bivalent for Types I and II, could not be expected to benefit all cases. The ophthalmic test was carried out to detect sensitivity to serum, and where this was positive or where the patient had suffered from asthma or other allergic condition, the antiserum was not used. The doses given were 5, 25 and 45 cubic centimetres at

intervals of two hours. If the typing of the sputum revealed a Type I or Type II pneumococcus, further doses might be given if considered desirable; if other organisms were found, serum treatment was discontinued.

The net result of the inquiry was that out of 421 cases of pneumonia, 188 of Type I infection were found and treated with serum; among these the death rate was 10.6%, as contrasted with a rate of 25.9% in 85 untreated cases of the same type. This is most encouraging, for not only does it indicate that the death rate of pneumonia may be appreciably lowered, but that the treatment is within the scope of every intelligent practitioner. It is hoped that means may be found to produce the serum more cheaply, as its high price at present is a bar to its wider use.

#### SPRUE IN A CHILD.

SPRUE has seldom been described as occurring in children. Though the disease is not often seen in Australia, it is important to know that it can occur in children. Reginald Miller has recently reported a case in which symptoms first became manifest in a boy when he was eleven and a half years old.<sup>1</sup> The child had lived in Ceylon for six years before symptoms made their appearance. The first symptoms were pain in the abdomen with vomiting and diarrhoea. Later the tongue assumed the appearance typical of sprue, and a megalocytic anemia developed. Miller points out that the boy showed all the temperamental characteristics of coeliac disease—the misery, the negativism and refusal of food, and the capacity to vomit foods that he thought he did not like. At the same time the comparatively quick development of severe hyperchromic anemia and the rapid improvement under treatment were unlike anything he had seen in coeliac disease. Manson-Bahr and Hamilton Fairley, who discussed the case at the meeting of the Royal Society of Medicine, both agreed with the diagnosis.

Several points in the treatment of this patient are worthy of note. The first has to do with the relative importance of the administration of liver and a low fat diet in the treatment of sprue. This boy was given a full anti-anemia treatment and was given a modified fat diet, without receiving benefit. It was only when he was given a really strict diet that he made any headway. The second point is that the comparatively small extra reduction of fat made all the difference. Miller states that probably the stricter diet abolished intestinal hurry and allowed time for the proper soaping of the faecal fat. Fairley states that on a high protein, low fat, low carbohydrate diet and adequate doses of liver extract patients with sprue recover with almost mathematical precision.

<sup>1</sup> The Journal of the American Medical Association, October 21, 1933.

<sup>1</sup> Proceedings of the Royal Society of Medicine, December, 1933.

## Abstracts from Current Medical Literature.

### PHYSIOLOGY.

#### Chloride and Urea Excretion in Healthy and Diseased Kidneys.

F. H. SMIRK (*Clinical Science*, Volume I, Number 1, 1933) has made a study of the excretion of urea and chloride in the urine of healthy subjects and of patients with renal disease. When 15 grammes of urea are given by mouth, most normal subjects attain a urinary chloride of 0.8% (as sodium chloride) either in the early morning sample, passed before the urea is given, or during the four or five hours subsequent to its administration. Under similar conditions of diet the urine of patients with nephritis rarely attains a chloride concentration of this degree. In both types of subject the administration of urea increases for a few hours the rate of chloride excretion, but in general the increase is more marked in normal subjects, even when both groups show the same rate of chloride excretion before the urea is given. Similarly, greater increases in the percentage of urinary chloride are found in normals than in nephritic patients when the chloride percentage in each group is the same before the urea is administered. Both in normals and patients with nephritis the plasma chloride is only slightly changed by giving 15 grammes of urea in 100 cubic centimetres of water, and while the plasma chloride usually tends to fall, the urinary chloride concentration and the rate of chloride excretion are generally raised. For equal percentages of plasma chloride normal subjects usually have a higher urinary chloride concentration than have patients with nephritis. It is concluded that the increased chloride excretion is not caused by the mobilization of extra chloride into the blood and that the relatively small chloride excretion in nephritis without oedema is not the result of a fall in plasma chloride below the normal value, but is probably of renal origin. In nephritic patients, as contrasted with normal subjects, a high urea concentration in the urine is usually attained at the expense of the urinary output, and if the maximum urea percentages and the corresponding rates of urine formation are considered together, a much more complete separation can be made between mild cases of nephritis and normal subjects than by using the urea percentage alone. The total amount of urea excreted in the four or five hours after the dose of this substance is given indicates whether urea retention would be likely to occur with a high protein diet. Fixation of the urea percentage at a low level, such as 0.9% to 1.2%, is usually, but not always, an indication of a bad prognosis. During the four or five hours following the administration of 15

grammes of urea in 100 cubic centimetres of water it is observed that in patients with nephritis the rises in the urinary urea percentage are frequently accompanied by falls in the urinary chloride concentration. Similarly, when the urea percentage falls, the chloride concentration tends to rise. In normal subjects this inverse relationship between the urea and chloride concentrations is uncommon, and high concentrations of both substances often occur together. If U be the maximum urea percentage in a four- or five-hour test and C the chloride percentage (as sodium chloride) in the urine sample in which this maximum value was obtained, then the expression  $CU/2$  is greater than 2 in practically all normal subjects, provided that the diet has not been very poor in chloride, and less than 2 in almost all cases of nephritis, however mild. In patients with severe nephritis and inability to concentrate urea the chloride percentage in the urine is at all times less than that in the blood. It is probable that the low chloride concentration allows urea to be concentrated with less difficulty. If 13 grammes of urea and 3 grammes of potassium chloride are given by mouth, most normal subjects attain a urinary urea concentration of 2% or more and a chloride percentage of 0.8 (as sodium chloride), whereas most patients with nephritis fail to attain a chloride concentration of 0.8%.

#### The Pituitary Gland and Carbohydrate Metabolism.

A. B. CORKILL, H. P. MARKS AND W. E. WHITE (*Journal of Physiology*, December, 1933) have found that rabbits from which the pituitary gland has been removed become abnormally sensitive to the hypoglycaemic action of insulin and may even develop a spontaneous hypoglycaemia, especially if they are deprived of food for several hours. In those animals exhibiting spontaneous hypoglycaemia the glycogen stores are found to be depleted, and it is suggested that this lack of available carbohydrate may be a contributory cause of the fall in blood sugar. Depletion of the glycogen stores is not the cause of the increased response to insulin, as this is observed in animals which have ample reserves of liver glycogen. The response to insulin is characterized by a delay in the return of the blood sugar to its previous level. Although in the normal animal injections of adrenaline or vaso-pressin will usually relieve the symptoms of hypoglycaemia, in the absence of the pituitary gland such injections have little effect. Animals which are abnormally sensitive to insulin usually exhibit also a diminished response to adrenaline and an increased sugar tolerance. It is suggested that an abnormal resistance of the glycogen reserves to the mobilizing action of adrenaline may be a factor in the increased sensitivity to insulin. Young rabbits which

normally store glycogen in the liver as a result of insulin injection fail to do so when deprived of the pituitary gland.

#### Blood Sugar Regulation after Operative Lesions of the Anterior Lobe of the Hypophysis.

H. LUCKE, E. R. HEYDEMANN AND R. HECHLER (*Zeitschrift für die gesamte experimentelle Medizin*, March, 1933) have produced lesions of the anterior lobe of the pituitary gland in dogs, and after the disappearance of all post-operative effects have investigated certain aspects of the carbohydrate metabolism in these animals. The fasting blood sugar falls to between 60 and 80 milligrammes per 100 cubic centimetres, whereas in a normal dog the administration of 50 grammes of glucose by mouth caused a rise in the blood sugar of only 35 milligrammes per centum; in the operated animal a corresponding dose was followed by an increase of 53 milligrammes per centum. In the latter case the initial rise was followed by a fall four hours later, the blood sugar reaching a level some 15 milligrammes per centum below the initial fasting value. The injection of one cubic centimetre of an adrenaline solution, which in normal dogs produced a rise in the blood sugar of about 30 milligrammes per centum, was followed in the animals with pituitary lesions by an increase of some 180 milligrammes per centum. Although the blood sugar in the operated animals might reach a level of 250 milligrammes per centum, no sugar appeared in the urine. The response to insulin in the experimental animals was markedly increased, and even after very small doses the hypoglycaemia was often of an extreme grade; in one case three units of insulin produced a fall in the blood sugar from a resting value of 80 to 32 milligrammes per centum.

### BIOLOGICAL CHEMISTRY.

#### The Fasting Blood Sugar in Schizophrenia.

WILLIAM FREEMAN (*The American Journal of the Medical Sciences*, November, 1933) has presented a study of the fasting blood sugar levels as disclosed by six samples taken at standard intervals from each of 59 male schizophrenic patients over a period of six and a half months. In 95% of 347 determinations the values lay between the conventional limits of normality, namely, 80 and 100 milligrammes per 100 cubic centimetres. The average value was 96.6, as compared with an average of 95.4 milligrammes in 31 normal control subjects studied under the same conditions and by the same technique. Eight readings were obtained in the hypoglycaemic and eight in the hyperglycaemic ranges. The variation among the schizophrenics was higher than that



in the controls, as was shown by the coefficients of variation, 11% and 6.9% respectively. Some of the findings obtained suggest that habituation with a presumable lessening of emotional reaction to the test played a part in determining the blood sugar level. There was no significant correlation between the blood sugar level and the age, period of hospitalization, or severity of the psychosis. Of the subgroups the hebephrenics showed the highest average value, and the catatonics the lowest. The authors conclude that schizophrenia is characterized by normal fasting blood sugar levels, but that the individual variability is somewhat greater than in normal subjects.

#### Vitamin A Deficiency.

A. F. HESS AND J. M. LEWIS (*The Journal of the American Medical Association*, August 26, 1933) report results of an investigation into the value of vitamin A as an anti-infective agent. It had previously been shown that regular administration of cod liver oil did not prevent infections in children under three years of age. During the present investigation 40 children were given 20 drops of haliver oil and a similar dose of "Viosterol" per day; 40 others received "Viosterol" plus 20,000 units of carotene in oil, and 80 control patients were given "Viosterol" alone. Haliver oil, like cod liver oil, contains abundant vitamins A and D. After five months of this treatment it was evident that none of these substances prevented the usual respiratory infections of childhood, and that otitis media, pneumonia, impetigo and other skin infections developed equally in all. There was no evidence that vitamin A protected children under three years of age from infection. Nearly all the children who received carotene developed definite signs of carotenemia, but there was no increase of blood platelets. Inquiry throughout the United States of America revealed that night blindness, the most delicate index of vitamin A deficiency, was a very rare disorder and was not increasing. The conclusion was that American dietary was not deficient in vitamin A.

#### The Effect of Cholesterol Ingestion on Tissue Lipids of Rats.

ALFRED CHANUTIN AND STEPHEN LUDWIG (*Journal of Biological Chemistry*, September, 1933) have presented analyses for the free cholesterol, cholesterol esters, and total lipids in the liver, kidney, heart, brain and blood of rats fed with stock and control diets poor in cholesterol. Values for the cholesterol esters were extremely small in the tissues studied. The ingestion of a cholesterol control diet containing 2.5% of cholesterol for a long period of time produced no changes in the analyses of the kidneys, blood, heart or brain, but there was an increase in the cholesterol esters and total lipid concentrations after a few days, and the maximum values were obtained after

350 days. The free cholesterol concentration increased after the third week of cholesterol ingestion. The lecithin values remained normal. The kidney, liver and blood of partially nephrectomized animals on a cholesterol-rich diet were analysed to find whether a disturbance in kidney function, with its accompanying syndrome of hypostenuria, polyuria, hypertension and nitrogen retention, would cause any change in the lipid metabolism. The hypertrophied kidney stump showed marked pathological changes accompanied by oedema, and there was a slight decrease in the concentration of free cholesterol and total lipid of these kidneys. The free cholesterol, cholesterol esters and total lipid concentration in the livers of these rats were all increased. The lipid values of the blood in these animals were increased. Supplementing a cholesterol-containing diet with high concentrations of fat or carbohydrate was found to have a striking effect on lipid metabolism. It was found that carbohydrates would accelerate and that fat could inhibit the deposition of cholesterol in the liver of the rat. In addition, the total lipid concentration was markedly increased. The authors conclude that the significance of a change in the total cholesterol of the liver must be interpreted only after the diet has been considered.

#### Renal Hypertrophy in Rats Fed on a High Protein Diet.

H. E. C. WILSON (*The Biochemical Journal*, Volume XXVII, Number 5, 1933) has carried out a series of experiments to discover the cause of the enlargement of the kidneys in rats fed on a diet rich in protein. The diets employed in the experiments and all the experimental details are given in full. The first series of experiments was carried out with liver, gelatin and caseinogen, and it was found that gelatin tended to produce a more pronounced increase in kidney weight than either the caseinogen or liver. Glycine, glutamic acid and gluten were all found to produce an increase which was more or less proportional to the additional nitrogen consumed. The author considers it likely that the renal hypertrophy is associated with some stage in the intermediary metabolism of protein, probably deamination by the kidney.

#### The Urine Proteins and Serum Proteins in Nephritis.

ELSIE MAY WIDDOWSON (*The Biochemical Journal*, Volume XXVII, Number 4, 1933) has investigated the identity of the urine proteins and serum proteins of nephritic patients by means of the Van Slyke nitrogen distribution method; and, further, has examined these proteins by a study of their racemization curves, osmotic pressures and specific refractions. A normal healthy man was selected as the source of material for the normal plasma proteins, and the blood and urine in cases of proteinuria were

obtained from in-patients in Middlesex Hospital. All methods used are given in detail. The results of the analyses indicate that the proteins isolated from the urine of patients suffering from nephritis or nephrosis are identical with the corresponding serum proteins, and there is no evidence of any alteration in the chemical or physical structure of the proteins during their passage through the kidney. The proteins isolated from the urine and serum of these patients suffering from nephritis also appeared to be identical in chemical and physical structure with those of normal human serum. The urine and serum proteins of a patient suffering from nephrosis exhibited certain slight differences in chemical structure from the normal serum proteins. The racemization curves, osmotic pressure and specific refractions of the urine and serum proteins of a patient suffering from nephrosis, however, appeared to be identical with those of the proteins from normal human serum.

#### Blood Changes in Intestinal Obstruction.

D. W. ATCHLEY (*New York State Journal of Medicine*, October 15, 1933) argues the importance of the chemical changes produced in the blood by the rapid removal of water and electrolytes (mainly sodium chloride) from the circulation in an individual to whom the ordinary routes of replacement are obviously closed. A very similar pattern is found in several disease conditions, fundamentally different, but having the same common denominator of salt and water depletion. The end result is peripheral circulatory failure and the elevation of blood urea that ensues is probably an expression of the effect of this failure on the renal tissue. In high intestinal obstruction this mechanism dominates the picture. In low obstruction a variety of disturbances, wholly unrelated, may combine to form a clinical problem difficult to analyse, yet the chemical component is always present, and though its relative value may vary, it must be reckoned with when therapy is being planned. Treatment is essentially a replacement therapy. Adequate amounts of normal saline or Ringer's solution must be administered intravenously. Simple glucose solution may be harmful, as it may act as a diuretic. Glucose is of value in combating ketosis, but it must be given in saline solution. Water cannot be retained without its skeletal structure of salt. The ideal is 5% glucose in normal saline solution. In these conditions the use of intravenous therapy has been too timid. There is no need to fear overstrain on the heart if the infusion be given with a twenty gauge needle. Therapy consists in replacement as rapidly as possible. Absorption from the subcutaneous tissues and rectum is too slow for these routes to be used when dehydration is advanced and shock is part of the picture.

## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Sydney Hospital, Sydney, on October 19, 1933. The meeting took the form of a series of clinical demonstrations by members of the honorary staff. The first part of this report was published in the issue of March 24, 1934.

#### Carcinoma of the Rectum.

DR. HOWARD BULLOCK showed a man, aged fifty-five years, who had been admitted on March 16, 1933, and discharged on June 7, 1933. Four days before admission he had awakened with severe pain in the lower part of the abdomen and had vomited. The pain continued; but the vomiting ceased until after admission. He had suffered from recurrent attacks of diarrhoea over a period of two years, had passed blood by the bowel, and had lost a little weight. There had been no bowel action during the four days prior to admission. On examination the abdomen was found to be distended and tense; no tumour was palpable; the rectum was distended. Blind caecostomy was performed on the day of admission. X ray examination on March 22, 1933, revealed obstruction to a barium enema in the sigmoid colon. On April 7, 1933, abdomino-perineal resection of the colon and left inguinal colostomy were done; carcinoma of the rectum was found, and the rectum was removed with the colon. The caecostomy opening was closed on May 5, 1933. By histological examination the growth was found to be an adeno-carcinoma invading the muscle; in one lymphatic gland there was evidence of early carcinomatous changes.

Dr. Bullock remarked that this was a rare type of rectal cancer, causing constriction and acute intestinal obstruction. He pointed out the advantage of caecostomy in these cases, in keeping the left side of the abdomen free for further operative procedures.

Dr. Bullock next showed a man, aged sixty-two years, who had been admitted on May 25, 1932, and discharged on September 14, 1932. At the time of admission the patient stated that he had passed mucus, slime and blood by the bowel for a period of four years; he had had no control over his faeces since an operation on the rectum for removal of a growth twenty years previously. At the time of admission no tumour was palpable at rectal or abdominal examination. The sphincter ani muscle could not be felt. The rectum was lax. Faeces and slime were oozing from the anus. On May 27, 1932, a small round tumour projecting from the mucous surface of the rectum was seen with a sigmoidoscope about 15 centimetres (six inches) from the anus. Inguinal colostomy was performed on the left side the same day; a hard mass was palpable low in the sigmoid region; the hypogastric lymphatic glands were found to be enlarged. On June 17, 1932, abdomino-perineal resection of the rectum was performed. Histological examination revealed that the tumour was an adeno-carcinoma with a slight tendency to colloid change; the mesenteric glands were not invaded.

Dr. Bullock contrasted the conditions following the first operation, twenty years previously, at which the anal opening had been preserved, with those following the radical operation performed by himself. The artificial anus remained clean and free of unpleasant odour; the former condition of lack of control over the anus had been accompanied by faecal contamination of the clothes and foul odour. It was interesting that the growth should recur in the same region; this indicated that Miles's teaching of radical and extensive removal of bowel in these cases was correct.

#### Volvulus of the Colon.

Dr. Bullock's next patient was a man, aged forty-eight years, who had been admitted to hospital on April 1, 1918, and discharged on June 7, 1918. Three weeks before admission the patient had experienced severe epigastric pain; this had continued and had been particularly severe

during the three days prior to admission; he had been vomiting for one day. The bowels had acted regularly with the aid of aperients. Examination revealed tenderness and rigidity in the epigastrium; the temperature was normal and the pulse rate 84 per minute. On the day of admission the abdomen was opened through a right para-rectal incision in the upper part of the abdomen; the stomach, duodenum and gall-bladder were found to be normal; the colon was found to be distended; the appendix was removed through a McBurney incision. The following day caecostomy was performed. At a further operation on April 19, 1918, the pelvic colon was found to be fixed with adhesions and to be very long and to possess a very small mesentery; it was resected. On May 10, 1918, the caecostomy opening was closed. The patient made an uneventful recovery and had remained well since.

Dr. Bullock remarked that the interesting feature was that the lesion in the lower part of the abdomen had caused symptoms suggestive of a lesion in the upper part; caecostomy had relieved the volvulus, which at first had not been diagnosed.

#### Peptic Ulcer.

Dr. Bullock's next patient was a male, aged forty-one years, who had been admitted on June 28, 1933, and discharged on July 19, 1933. He had suffered from attacks of abdominal pain for twelve months; his symptoms had been more severe during the six months prior to admission. The attacks lasted one to four days; the pain was relieved by food or vomiting, but not by alkalis. The appetite was poor and the patient had lost 12.6 kilograms (two stone) in weight in six months. Nothing significant beyond evidence of loss of weight was discovered at clinical examination. No abnormality was detected in the gastric contents. Radiological examination revealed gastric dilatation, but no organic defect of the stomach or duodenum. At operation on June 30, 1933, a chronic ulcer was found on the lesser curvature of the stomach; partial gastrectomy and posterior gastro-enterostomy were done. Histological examination of the ulcer revealed no evidence of malignancy.

Dr. Bullock remarked that the interesting features of this case were: the relief of pain by food, but not by alkalis, the loss of appetite, the loss of weight, the normal state of the gastric contents, and the fact that six X ray examinations (the last two days before operation) had been made without revealing any evidence of organic lesion. At the time of the meeting the patient was very well, having gained over 12.6 kilograms (two stone) in weight since the operation.

#### Carcinoma of the Pharynx.

Dr. Bullock next showed a male patient, aged fifty-three years, who had been admitted to hospital on May 17, 1933, and discharged on June 14, 1933. The patient had first noticed a swelling in the back of the mouth five weeks before admission. A fungating growth, about the size of a one-shilling piece could be seen in the buccal cavity on the left side on the soft palate, adjacent to the gingival margin; it was very hard. There was no reaction to the Wassermann test. On May 19, 1933, the glands in the area of lymphatic drainage were excised. On June 2, 1933, the primary growth was excised with a diathermy knife. By histological examination the tumour was found to be a squamous carcinoma with keratin formation; the glands had not been invaded.

Dr. Bullock stressed the advantages of diathermy in this case; if older methods had been used, portion of the jaw would certainly have been sacrificed. There was as yet no evidence of recurrence; but Dr. Bullock pointed out that only a short period had elapsed since the operation.

#### Carcinoma of the Penis.

Dr. Bullock's next patient was a man, aged sixty-one years, who had first noticed a small "blister" on the glans penis six months before admission to hospital on April 5, 1933; the growth had gradually extended. There was no discharge. The patient had suffered from recurrent attacks of scalding at micturition for years. Examination



revealed a superficial papular lesion of the whole of the end of the *glans penis*. The area was firm and did not bleed at examination; superficial ulceration was present in the lower part. No enlarged gland was palpable in the groin. There was no reaction to the Wassermann test. On April 7, 1933, suprapubic cystostomy was performed. On April 21, 1933, five needles of one milligramme and three needles of 0.5 milligramme of radium were buried in the substance of the glands; they were left *in situ* for six days. Thus a dose of 936 milligramme-hours per cubic centimetre was given. At the same time the inguinal glands on both sides were removed. At the time of the meeting a small area only of the carcinoma remained.

Dr. Bullock contrasted this with the next case, in which a radical operation had been performed. He stressed the value of suprapubic cystostomy as a preliminary to radium therapy in such cases.

Dr. Bullock also showed a male patient, aged seventy years, who, at the time of admission on March 4, 1931, had stated that there had been progressive enlargement of the penis during the previous twelve months. The *glans penis* was eroded, stony-hard and foul-smelling; one small gland could be felt in the left inguinal region; the patient also had an inguinal hernia on the right side and hydrocele on the left side. Before the patient's admission histological examination of biopsy material had shown the condition to be one of squamous carcinoma. There was no reaction to the Wassermann test. At operation the penis was removed and the lymphatic glands of both groins were dissected out. Histological examination revealed no invasion of the glands. The patient was discharged from hospital on April 14, 1931; he was readmitted on June 23, 1932, complaining of pain in the lower part of the abdomen. X ray examination revealed rarefaction of the pubic bone, suggesting metastasis. The patient was then given deep X ray therapy, as a consequence of which the rarefied area disappeared.

Dr. Bullock pointed out that the patient suffered no disability as a result of the operation.

#### Abscess of the Lung.

Dr. Bullock's last patient was a woman, aged twenty years, who had been admitted to hospital on March 4, 1932. Eight months before admission she had suffered from pneumonia on the right side following confinement; from that time onward she had had a severe cough accompanied by the expectoration of copious foul-smelling sputum (as much as 300 cubic centimetres, or half a pint, a day). She had also had severe hæmoptysis and had lost a great deal of weight. At the time of admission she was very pale; the right side of the chest moved poorly; the percussion note on the right side was impaired, and there were bronchial breathing and râles to be heard on the same side. X ray examination revealed consolidation of the right lung with central translucency suggesting abscess, and the presence of fluid at the right base. Tubercle bacilli were not found in the sputum. Examination of the blood revealed secondary anaemia. On March 11, 1932, the right phrenic nerve was evulsed. The patient's condition improved to some extent and she was discharged on April 9, 1932. She was readmitted on May 19, 1932, in an unchanged condition, save that she was now suffering from melancholia. On June 15, 1932, the abscess was drained and portions of the lower seven ribs were resected extrapleurally. On July 6, 1932, portions of the remaining ribs were removed.

Dr. Bullock remarked that the patient had been an invalid and unable to move about on account of weakness; she had had a constant cough and had continually expectorated pus. Since the operation she had gained 12.6 kilograms (two stone) in weight, no longer suffered from breathlessness, and was in fact able to sing in a choir.

#### Artificial Pneumothorax.

Dr. E. H. Stokes showed a girl, aged sixteen years, who had first come under observation on December 15, 1932, when she had complained of a cough of some months' duration and scanty menstruation. She stated that she had been subject to colds in the chest all her life. She had lost 1.8 kilograms (four pounds) in weight during

the previous three months. At that time she was very pale; her temperature was 38.3° C. (101.2° F.) and the pulse rate 118 per minute (at 4 p.m.). Her weight was 51.75 kilograms (eight stone three pounds). Crepitations and impairment of the percussion note were found anteriorly between the third and the sixth ribs on the right side. X ray examination revealed tuberculous infiltration of the right upper and middle lobes. The sputum was examined on seven occasions; tubercle bacilli were not found. Artificial pneumothorax was induced and maintained till July, 1933. An effusion had since formed and had been left undisturbed. The patient had improved considerably and, at the time of the meeting, weighed 56.7 kilograms (nine stone).

Dr. Stokes's next patient was a woman, aged twenty-three years, who had first come under observation on February 9, 1933. She had been referred from the ear, nose and throat department, where it had been found that she was suffering from tuberculous laryngitis. Hoarseness and sore throat had been present for two months. She had lost some weight and had suffered from night sweats and the expectoration of yellow sputum. Examination revealed her as a tall, thin woman who had apparently lost a considerable amount of weight. Her temperature at 3 p.m. was 37.3° C. (99.2° F.) and pulse rate 124 per minute. Her weight was 43.2 kilograms (six stone twelve pounds). It was noted that the chest was long and narrow. Crepitations were heard in the left subapical region. X ray examination revealed an advanced tuberculous lesion of the left lung, most marked in the subapical region, where there appeared to be some cavity formation. The lesion appeared to be fairly recent and active. There was slight but definite involvement of the left lung external to the hilum. Artificial pneumothorax was induced and maintained. There was considerable difficulty in inducing the pneumothorax; but adhesions gradually stretched and at the time of the meeting the lung was adherent only at the left apex. The patient's weight had increased to 47.7 kilograms (seven stone eight pounds) and she felt very well. The larynx was now almost normal in appearance.

Dr. Stokes also showed a woman, aged twenty-four years, who had been referred to him by Dr. Brodie Grant and had first been seen by him on April 24, 1933. She had suffered from a cough for some time and had improved after treatment for some months at Thirlmere Sanatorium, but recently had been losing weight. On examination it was seen that her general nutrition was good. The temperature was 36.9° C. (98.4° F.) and the pulse rate 120 per minute. Crepitations and impairment of the percussion note were found at the apex of the right lung anteriorly. The sputum contained seven tubercle bacilli per average field. X ray examination of the chest revealed a definite tuberculous lesion of the right subapical region, apparently fairly recent and active. On May 1, 1933, she was admitted to hospital. Artificial pneumothorax was induced and had been maintained. Her general condition had since improved.

Dr. Stokes also showed a boy, aged sixteen years, who had been referred to him by Dr. W. L. Calov. He first came under observation on July 27, 1933. He had suffered from a cough with much sputum for twelve months. There had been no hæmoptysis and there was no family history of tuberculosis. On examination it was seen that a malar flush was present. The temperature was 37.3° C. (99° F.), and his weight 34.6 kilograms (five stone seven pounds). Crepitations could be heard in the left subapical region. The X ray report was as follows: "Infiltration throughout the left lung with pleural thickening and apical pneumothorax suggests pulmonary tuberculosis". The sputum contained tubercle bacilli, and the red blood cell sedimentation was rapid. Artificial pneumothorax was induced and maintained. Slight improvement followed. Since the collapse of the lung the radiological appearances suggested the presence of a large cavity at the apex rather than a localized pneumothorax.

#### Neoplasm of the Lung.

Dr. Stokes's next patient was a man, aged sixty-three years. This patient was shown at a meeting of the

Branch held in July, 1931, at Sydney Hospital. Deep X ray therapy had since been applied to the chest. Improvement had resulted, the weight having increased and the mass in the right side of the chest having decreased in size. Dr. Stokes remarked that the lesion was probably an endothelioma of the pleura.

Dr. Stokes next showed a woman, aged thirty-nine years, who had first come under observation on July 7, 1932, seven weeks after an attack of influenza. Physical examination revealed the presence of a pleural effusion on the left side. This had since been aspirated and replaced with air on six occasions. The fluid removed was blood-stained. Microscopic examination of the fluid revealed the presence of red blood cells, leucocytes (the predominating variety being neutrophilic cells) and a few endothelial cells. Tubercle bacilli were not found; attempts at culture failed. The patient had received deep X ray therapy and had remained in good health. Dr. Stokes remarked that in view of the recurrence of the blood-stained effusion it was considered that she was suffering from a pulmonary neoplasm.

#### Bronchiectasis.

Dr. Stokes's next patient was a man, aged thirty years, whom he had first examined on March 13, 1933. Shortly before that time he had been a patient in the Coast Hospital. Owing to his being a foreigner, it was difficult to obtain a satisfactory history; but it was ascertained that he had been expectorating a large amount of foul-smelling sputum. On examination it was seen that he was very sick. His temperature was 38.9° C. (102° F.). An area of impaired resonance was noted at the base of the left lung. Posteriorly over this area amphoric breathing with resonating crepitations was heard. The fingers were clubbed.

An X ray report was as follows: "Some consolidation at the left base suggests either lung abscess or bronchiectasis". Injection of lipiodol showed some bronchi to be dilated. Tubercle bacilli were not found in the sputum. The blood serum reacted to the Wassermann test. The patient had improved considerably after the administration of anti-syphilitic treatment. At the time of the meeting there was practically no sputum.

#### Obesity of Pituitary Origin.

Dr. Stokes also showed a woman, aged twenty-eight years, whom he had first seen on December 22, 1932. She had then complained of increasing weight and stated that she had suffered from palpitation and shortness of breath for twelve months. Her weight at the time of the first consultation was 107.1 kilograms (seventeen stone). It had increased by 6.3 kilograms (one stone) during the previous twelve months.

On examination it was seen that the obesity was chiefly of the girdle type. An abdominal apron of fat was present. The limbs were shapely. X ray examination of the skull showed the pituitary fossa to be small. She was treated by means of thyroid and pituitary extracts. The carbohydrates in the diet were restricted. Her weight on October 16, 1933, was 92 kilograms (fourteen stone eight and a half pounds).

#### Hodgkin's Disease.

Dr. Stokes also showed a male patient, aged twenty-two years, whom he had first seen on August 7, 1933. He complained at that time of pain and swelling of the left side of the neck of nine months' duration. He stated that the swelling had varied in size from time to time. On examination it was seen that the lymphatic glands of the left posterior triangle of the neck were enlarged and tender. In September, 1933, it was noted that the inguinal and axillary lymphatic glands had also become enlarged. The spleen was not palpable. There was no reaction to the von Pirquet test. On August 23, 1933, Dr. Shearman reported that the blood serum was anti-complementary with dilutions up to 1 in 80 in regard to the Wassermann test; but on September 15 he found that the blood serum failed to react either to the Wassermann

or the Kahn test. On August 11, 1933, the red blood cells numbered 4,730,000 per cubic millimetre; the haemoglobin content was 91%; the colour index was 0.96; the leucocytes numbered 5,600 per cubic millimetre, and of these 56% were polymorphonuclear leucocytes, 25% were lymphocytes, and 15% were monocytes. There was some variation in the size of the red cells.

A gland was removed from the neck for biopsy. Dr. Keith Inglis reported on August 25, 1933, as follows:

The sections show much fibrosis, loss of normal architecture and conspicuous Reed-Sternberg cells. Polymorphonuclear cells are abundant and a few eosinophiles are to be seen. Occasional mitotic figures are present. The histological picture is strongly suggestive of Hodgkin's disease.

The patient was admitted to hospital in September, 1933, and since admission deep X ray therapy had been applied to the glands. Early in October a typical Pel-Ebstein temperature chart was noted. The glands had decreased considerably in size under treatment.

#### Gastric Ulcer Treated Medically.

Dr. Stokes showed three skiagrams taken after the administration of opaque meals to a patient suffering from gastric ulcer. The second skiagram was taken about three weeks after the first, and the third about three months after the second. Dr. Stokes pointed out that they illustrated the disappearance of the ulcer crater as a result of medical treatment.

#### NOTICE.

THE Medical Secretary of the New South Wales Branch of the British Medical Association announces that the following books have been added to the library of the Branch.

"Nervous Disorder in Infancy and Childhood", N. Hobhouse; "Sound Conduction and Hearing", A. Zund-Burguet; "A Short History of Surgery", D'Arcy Power; "Blood Pictures: An Introduction to Clinical Hematology", C. Price-Jones; "Surgical Diseases of the Thyroid Gland", E. M. Eberts; "Treatment of Rheumatoid Arthritis and Sciatica", A. H. Douthwaite; "Diphtheria Immunization", J. G. Wilson; "Treatise on Materia Medica and Therapeutics", R. Ghosh; "Some Radium Cases at the Middlesex Hospital", A. C. Macleod; "Pocket Atlas of the Fundus Oculi", G. L. Johnson; "Physiology of Bacteria", O. Rahn; "Synopsis of Surgery", E. W. Hey Groves; "Text-Book of Neuropathology", A. Well; "Therapeutic Uses of Infra-Red Rays", W. A. Troup; "Introduction to Neurology", C. J. Herrick; "Clinical Examination of the Nervous System", Monrad-Krohn; "Practice of Surgery", R. Howard; "The Organs of Internal Secretion", I. G. Cobb; "Practical Obstetrics", P. B. Bland; "Röntgen Rays in Dermatology", L. Arzt and H. Fuhs; "Experiences of a 'Dinki Di' R.R.C. Nurse", G. F. Moberly; "Science and Democracy", F. Trinca.

#### NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Cunningham, William Davies, M.B., B.S., 1933 (Univ. Sydney), Newcastle Hospital, Newcastle.  
Morton, Charles Robert, M.B., B.S., 1933 (Univ. Sydney), Newcastle Hospital, Newcastle.  
Hudson, Carlyle Penrose, M.B., B.S., 1933 (Univ. Sydney), Newcastle Hospital, Newcastle.  
Brown, David Richmond, M.B., 1928, B.S., 1930 (Univ. Sydney), Dora Creek.  
Ritchie, Thomas John, M.B., B.S., 1933 (Univ. Sydney), Coonamble.



## Correspondence.

## INFLUX OF EUROPEAN PRACTITIONERS.

SIR: I was glad to see the letter under the above heading in your issue of March 3. Our profession in Australia is already much overcrowded, so why should our politicians go out of their way to make this worse and to do it at the expense of our native born and Australian-trained practitioners. On the ship by which I returned from a recent trip abroad were several Germans making their way to South Africa, which country at present seems to be the Mecca for such people on account of the gold boom. They explained to me that Jews are not being actually expelled from Germany by the Nazis, but that it is in every way being made impossible to make a living. In the first instance all government and university appointments were taken from them and given to Hitler supporters. Next, if a Jewish professional man qualified after the war, he is compelled to put "Jewish doctor" or "Jewish solicitor" after his name, and anyone seen going to consult him has to undergo the severest persecution. Hitler, before assuming office, like all aspiring politicians, made all sorts of extravagant promises, and now is being called on to fulfil them in some sort at least. So he has chosen the Jews as being a minority community and is trying to force them out to make room for the true-blue Nazi. While feeling the utmost sympathy for these unfortunates, I ask why should Australia be victimized in order to allow Hitler to carry out his schemes. The talk about reciprocity is an utter sham. Let any Australian doctor try practice in Germany and he would be browbeaten and tabooed at once. Quite recently there was correspondence in the London newspapers from two Englishmen who had established a prosperous business in Germany. The present régime informed them that no business could be conducted except with German principals. They could be employees in the business, but not employers, so they had to close down. Not long back inspired paragraphs appeared in one London newspaper advocating that positions should be found for these dispossessed Germans in the English universities and hospitals, and, of course, with the usual suggestion that they were more famous and better qualified than the men at home. Driving along Whitechapel, I was absolutely staggered to see the foreign names on every second shop; they have absolutely captured that part of the city, and even the street signs at the corners are in Yiddish as well as English. In fact, the latest definition of speed in London is: "Hitler taking a motor drive along Whitechapel."

Australia has quite enough to do at present to cope with its own problem of low prices, diminished incomes and unemployment, so why add to the trouble by allowing a lot of pushed-out foreigners to come in freely when in prosperous times they were barred.

Yours, etc.,

CUTHBERT HALL.

135, Macquarie Street,  
Sydney,  
March 5, 1934.

## VITAMIN C.

SIR: In his interesting article on vitamin C (THE MEDICAL JOURNAL OF AUSTRALIA, March 10, 1934) Geoffrey Bourne seems to sponsor the statement that not until 1847 did Dr. Lind conduct the experiments which led to the banishing of scurvy from every ship which sailed the sea.

In this sentence I seem to detect the hand of an erring compositor, for James Lind's book (he named it "An Essay on Diseases Incidental to Europeans in Hot Climates") issued from John Murray's Fleet Street press during the year 1748.

It is of interest to read, too, that while the researches which drove Lind to advocate the employ of antiscorbutics

were carried out upon human material, the great William Harvey had, years before, sought (and, to my mind, found) a cure for the disease after the conduct of experiments upon rats.

Through all these years the British Admiralty hummed and hawed while our profession did its utmost to deliver the sailor from blue water's worst scourge. In 1657 John Hall, a Warwickshire doctor, shouted from an upstairs window that he could cure scurvy by the use of a decoction of water cress. One might imagine that his hearers would listen to him, since he was son-in-law to William Shakespeare, a playwright of some note at that epoch; yet not until 1795 were antiscorbutics a routine issue in the Royal Navy, and only seventy odd years ago were British sailors christened "lime-juicers". No wonder that Sir Richard Hawkins said, in the early days of the seventeenth century, that he had seen ten thousand men die of scurvy during his twenty years at sea.

Yours, etc.,

FDK. J. BRIDGES.

Chatswood,  
New South Wales,  
March 10, 1934.

SIR: In his recent article (March 10, 1934) Geoffrey Bourne states with reference to the presence of vitamin C in the aqueous humour, that "it may be of significance that cataracts are often ripened by puncturing the aqueous humour". As, clinically, paracentesis of the anterior chamber is never followed by any change in the translucency of the lens, unless the surgeon is so unfortunate as to pierce its capsule, "maturation" is apparently the procedure referred to.

The so-called operation of "maturation" consists of stroking the lens capsule with a blunt instrument, an iridectomy usually being performed at the same time. It is hoped that, as a result of the mild trauma induced, the "ripening" of the cataract will be hastened. There is no reliable evidence to prove that the desired result is ever attained. The operation is quite an illogical one and, together with the precautionary "preliminary iridectomy", plays no part in modern ophthalmic surgery.

Yours, etc.,

KEVIN O'DAY.

2, Collins Street,  
Melbourne,  
March 19, 1934.

## TWIN BIRTHS.

SIR: I would like to report the fact that on the fifth instant I delivered a woman of twins—a boy weighing nine and a half pounds and a girl nine pounds.

As these weights, in my experience, are rather extraordinary, I should like to have the views of other practitioners on the subject.

Yours, etc.,

C. T. UNDERWOOD.

Goomeri,  
Queensland,  
March 12, 1934.

## THE THERAPEUTIC VALUE OF PSYCHOANALYSIS.

SIR: In the "Current Comment" of THE MEDICAL JOURNAL OF AUSTRALIA dated March 17, 1934, the article entitled "The Therapeutic Value of Psychoanalysis" describes a paper on that subject which appeared in *The Journal of the American Medical Association*, November 18, 1933. In the same number of the American journal is an editorial which contains this paragraph:

Naturally, many psychoanalysts will question the soundness of some of the principles followed by the authors in the evaluation of the therapeutic results.



Kessel and Hyman consider it an evidence of failure of the analysis if the analysis ends with a change in the life situation (marital status) of the patient which is contrary to the purpose with which the patient started his analysis, even though the symptoms and the neurosis may have been cured as a result of the treatment. The objection of psychoanalysts would be that frequently the patient's life situation, as for example, his marriage, has been itself the result of his neurosis. Neurotics, it is said, often choose unsuitable marital partners just as they choose unsuitable vocations, as a result of certain neurotic trends. In such cases it is quite unavoidable that the patient's cure sometimes results in his reorienting himself in his life situation. Leading psychoanalysts claim that improvement of a marital relation is a more frequent outcome of analysis than is divorce. In any case, the neurotic patient's expectations and demands at the beginning of the cure are frequently integral parts of his neurosis. It is at present a recognised principle in psychoanalytic practice, as in therapeutic science generally, that, in accepting a patient for treatment, the analyst or physician should not allow the patient to prescribe the conditions for his cure. Just as an internist could not possibly allow a diabetic patient to demand that he be made capable of tolerating a diet of the patient's own choice, so also is it not permissible for a psychoanalyst to undertake the task of making a violin virtuoso out of a person without musical talent.

If one applies the common sense principles enunciated in this editorial to the study of the results recorded in the article written by Kessel and Hyman it will be found that 57.5% of cases show good results, and of these 33.3% were cured.

The absurdity of the authors' method of evaluating psychoanalysis is conclusively demonstrated in their description of a case which is included in the list of bad results:

In one instance a woman was married to an impotent male. Her analysis had for its purpose an attempt to adjust herself to this situation and to preserve her home. The fact that she was divorced and that since she has remarried her symptoms have disappeared we regard as a failure of the method.

Despite the evident failure of the authors to make a completely detached evaluation of the results of psychoanalysis, one cannot but admire their attempt to do so. In nothing is this shown better than in their care in sending the patients to sound psychoanalysts. In the section in which they describe the qualifications of a psychoanalyst the authors rightly state "he himself (the psycho-analyst) should have submitted to a psycho-analysis by a previously accredited psycho-analyst". This is in fact the essential qualification required by the International Psycho-analytical Association.

In the section on "The Unqualified Pseudo-analyst" the authors correctly state:

It would be a grievous error if the internist were to condemn the method of psycho-analysis and its reputable practitioners for the sins committed by the counterfeiters.

Yours, etc.,  
R. COUPLAND WINN.

143, Macquarie Street,  
Sydney,  
March 17, 1934.

#### THE DETECTION AND ESTIMATION OF α-DINITROPHENOL.

SIR: I read with interest the excellent contribution of Dr. Adolph Bolliger in THE MEDICAL JOURNAL OF AUSTRALIA of the seventeenth instant, on the "Detection and Estimation of α-Dinitrophenol".

One remark called to my mind a point which I thought might be of interest, although I realise it is in no wise

germane to Dr. Bolliger's article. The remark was: "Such a pharmacological action (namely, the power to increase metabolism by 50%) . . . has so far only been applied on a large scale to the treatment of obesity, and quite favourable results have been reported."

I recently had a case of obesity which demonstrated Sajou's contention<sup>(1)</sup> that the treatment of this abnormality does not consist in every case of merely raising the metabolism, and in fact that in one particular type of obesity the act of raising the patient's metabolism actually causes an increase in weight.

Mrs. E.A., aged thirty years, who weighed fourteen stone, requested to be given a prescription for thyroid tablets, as she had heard that she could thus reduce weight.

According to Sajou's classification, this patient presented a case of "The Obesity of Hyperadrenalism", and I endeavoured to explain to her that rigid dieting, rest and freedom from undue emotional strain would be more in order in her case.

However, she was persistent in her demand for thyroid medication until after the exhibition of only half a grain night and morning for one week she had gained two pounds.

Subsequently, on an Ander's diet, accompanied by the appropriate routine suggested above, she lost over seven pounds in a little over three weeks, with a slight diminution in the pulse rate and without any untoward symptoms.

Yours, etc.,  
IAN GRAHAM, M.B.

Boggabri,  
New South Wales,  
March 18, 1934.

#### Reference.

<sup>(1)</sup> Sajou: "Analytic Cyclopaedia of Practical Medicine", Volume VII, page 155.

#### RAMISECTION AND SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM.

SIR: Your readers will think, on reading the report of the Victorian Committee appointed by the Royal Australasian College of Surgeons on sympathetic ramisection, that I have not published a paper on the subject for the last ten years. The operation criticized was abandoned for the upper limb six years ago and a new procedure was described in a paper entitled "Sympathetic Trunksection: A New Operation for Raynaud's Disease and Spastic Paralysis of the Upper Limb" (THE MEDICAL JOURNAL OF AUSTRALIA, October 6, 1928). I again altered the technique for spastic hemiplegia and spastic paraplegia and published my latest views on the subject in an article entitled "Observations on the Alteration of the Circulation of the Brain by Surgical Means in Diseases of the Central Nervous System" (The British Medical Journal, June 11, 1932).

The Committee has taken no notice of these publications, and this means that the report is criticizing procedures which are out of date and abandoned.

Yours, etc.,  
N. D. ROYLE.

185, Macquarie Street,  
Sydney,  
March 21, 1934.

#### INTRODUCTION OF DISEASE BY AEROPLANE.

SIR: It is, of course, unsatisfactory and scarcely fair to pass critical judgement on the opinions of a person which come under one's notice only in a shortened summary.

The importance of the issues raised in that summary and the far-reaching effect the conclusions (represented as being those of so eminent a person as Dr. Cumpston) on the medical and lay mind justify this critical review of the latter's address on the possibilities of the aeroplane introduction of disease to Australia, as outlined in your issue of March 3.

Re plague, Dr. Cumpston is represented as saying that "a rat was not likely to be included in the cargo of an aeroplane" and later: "Nor was it likely that a person with plague would want to go by aeroplane or would escape detection at the medical examination."

In view of the ever-increasing load and the also increasing variability of the nature of the cargo air-carried, it is by no means apparent why he makes this assumption.

As for his second statement, as printed, it is difficult indeed to see what bearing the remark has on the problem. One does not suppose indeed that a person actually ill with plague would desire to be a passenger on an air liner nor that he would be allowed to become one, but the incubation period of plague makes it more than a possibility that persons in the early stages of infection might arrive from eastern foci of infection and not show any evidence of the disease till (thanks to the speed of this new form of transport) they had mixed with the general population.

Soothing as Dr. Cumpston's remarks appear, they really give no promise of security at all.

Cholera is a disease of which I have only theoretical knowledge, but here again the speed of transport would appear to make it possible that there will be a considerably increased chance of early cases or carriers passing the cordon of quarantine officers.

Leprosy.—Here again Dr. Cumpston is quoted as saying that, as there will not be coolie crews of the planes, the introduction of this disease is "not likely". My own personal public health experience, especially in Queensland, teaches me that leprosy is no perquisite of coolies and that its incubation period, being very long, removes it largely from the effective control of the usual barriers. Here, however, the question may have less importance in view of the considerable leprosy population already existing, especially in certain parts of Queensland.

Yellow fever, the introduction of which per aeroplane Dr. Cumpston regards, if rightly quoted, as "very remote", has not so far apparently landed in Australia, but its harmless cousin, dengue, has, and the insect vector of both has also landed and spread widely and is still spreading further throughout the eastern coastal areas. The later increase in the dengue endemic zone has undoubtedly been due to the increased speed of car transit, and anyone who has seen, as I have, mosquitoes transported accidentally hundreds of miles by car cannot feel the same equanimity as to their detection in the numerous crevices of the cargo or mail room of the future planes. Other diseases not mentioned in the summary of Dr. Cumpston's communication, however, seem to constitute a further and perhaps a graver risk. These are the various fluke infestations of the gravest personal and national menace. Such conditions as schistosomiasis, paragonimiasis, with relatively long incubation periods and which present most anomalous symptoms, or none at all in early stages, even when they are already a source of infection, are often impossible to diagnose without tedious and repeated testing by laboratory methods. They are obviously infinitely more likely to escape detection on the short plane trip than the long sea voyage of other days.

There are the best reasons to suggest that when the population density of, say, schistosomiasis carriers becomes denser that adaptation of the life cycle to one or more of the indigenous water snails will occur. Moreover, the actual introduction of the melania or other eastern water snails is no mere fancy when tourists, flitting through the magic of the East, as is their wont, purchase all manner of rubbish, for example, goldfish in bowls or jars where the routine taboo insists on some water snails.

The ocean barrier and the consequent two to three weeks' trip entailed has done two things: it has delayed the entry of certain disease and lulled us into a false sense of security and with this has given rise to an unjustified belief in the efficacy of quarantine regulation.

Unless the latter service is awake to the fact that the blue ring of ocean was a greater ally than all the best man-made scientific control, and unless the department asks for and is given vastly greater powers and greatly

increased staff and equipment, their best efforts, now the blue barrier is forever gone, will, in my opinion, be sooner or later brought to nought by the hurrying needs of commercial aviation.

Yours, etc.,

BURTON BRADLEY.

Hurstville,  
New South Wales.  
Undated.

## Congresses.

### AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

A MEETING of the Australian and New Zealand Association for the Advancement of Science is to be held in Melbourne from January 16 to 23, 1935. As this meeting is to take place during the official centenary celebrations, it is hoped that there will be a large attendance.

Any medical practitioners who are likely to attend this meeting and who are desirous of presenting papers to the Section of Medical Science and National Health, are asked to communicate with the Sectional Secretary, Dr. Ewen Downie, 32, Collins Street, Melbourne, at their earliest convenience, in order that the work of the section may be arranged.

## University Intelligence.

### THE UNIVERSITY OF LONDON.

THE Director-General of Health of the Commonwealth advises that a cablegram has been received from the High Commissioner's Office, London, indicating that the Senate of the University of London invites applications for the Chairs of Medicine, Surgery, Obstetrics and Gynaecology at the British Post-Graduate Medical School, each position carrying a salary of £2,500 per annum. The University also invites applications for the Chair of Pathology at the same school at a salary of £2,000 per annum.

Applications, in twelve (12) copies, should be submitted to the Senate of the University of London by May 4, 1934.

## Obituary.

### HERBERT WILLIAMS KENDALL.

WE regret to announce the death of Dr. Herbert Williams Kendall, which occurred at Sydney on March 21, 1934.

## Books Received.

THE LAST OF THE TABOOS: MENTAL DISORDERS IN MODERN LIFE, by I. E. Hutton, M.D.; 1934. London: William Heinemann (Medical Books), Limited. Crown 8vo., pp. 217. Price: 6s. net.

THE HYGIENE OF MARRIAGE, by I. E. Hutton, M.D.; Fourth Edition; 1933. London: William Heinemann (Medical Books), Limited. Crown 8vo., pp. 154, with illustrations. Price: 5s. net.

ELECTRICITY IN OUR BODIES, by B. H. C. Matthews, M.A.; 1931. London: George Allen and Unwin, Limited. Crown 8vo., pp. 108, with illustrations. Price: 4s. 6d. net.

RECENT ADVANCES IN MEDICINE: CLINICAL, LABORATORY, THERAPEUTIC, by G. E. Beaumont, M.A., D.M., F.R.C.P.; D.P.H., and E. C. Dodds, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P.; Seventh Edition; 1934. London: J. and A. Churchill. Demy 8vo., pp. 504, with 58 illustrations. Price: 12s. 6d. net.



**THE RADIOLOGY OF BONES AND JOINTS**, by J. F. Brailsford, M.D., M.R.C.S.; 1934. London: J. and A. Churchill. Crown 4to., pp. 520, with 310 illustrations. Price: 30s. net.

**RADIOTHERAPY IN THE DISEASES OF WOMEN**, by M. Donaldson, B.A., F.R.C.S., M.B., B.Ch.; 1933. London: Hodder and Stoughton, Limited; Australia: Angus and Robertson, Limited. Demy 8vo., pp. 146, with illustrations. Price: 7s. 6d. net.

**AN OUTLINE OF PRACTICAL OBSTETRICS FOR NURSES**, by R. S. S. Statham, O.B.E., M.D., Ch.M., F.C.O.G.; 1933. Bristol: John Wright and Sons, Limited. Foolscap 8vo., pp. 139. Price: 2s. 6d. net.

**THE CULTURE OF THE ABDOMEN: THE CURE OF OBESITY AND CONSTIPATION**, by F. A. Hornibrook, with preface by Sir William Arbuthnot Lane; 1934. Australia: Angus and Robertson. Demy 8vo., pp. 111, with illustrations. Price: 6s. net.

**BEHIND THE DOCTOR**, by L. Clendening, M.D.; 1933. London: William Heinemann (Medical Books), Limited. Royal 8vo., pp. 490, with illustrations. Price: 21s. net.

**AIDS TO NEUROLOGY**, by E. A. B. Pritchard, M.A., M.D., M.R.C.P.; 1934. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 353, with illustrations. Price: 5s. net.

**ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY**, Volume IX, Monograph XVI, Part I: Influenza, by D. Thomson and R. Thomson; 1933. London: Baillière, Tindall and Cox; America: The Williams and Wilkins Company. Demy 4to., pp. 656, with 28 plates. Price: 42s. net.

**AIDS TO BOTANY**, by H. J. Bonham, B.Sc.; 1934. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 229, with illustrations. Price: 3s. 6d. net.

**HOW IS YOUR BREATHING?** by E. Mellor; 1934. London: Methuen and Company, Limited. Foolscap 8vo., pp. 61. Price: 1s. net.

**THE CANCER PROBLEM AND ITS SOLUTION**, by H. Gilford, F.R.C.S.; 1934. London: H. K. Lewis and Company, Limited. Post 8vo., pp. 60. Price: 2s. 6d. net.

## Diary for the Month.

- APRIL 3.—Tasmanian Branch, B.M.A.: Council.  
 APRIL 4.—Western Australian Branch, B.M.A.: Council.  
 APRIL 5.—South Australian Branch, B.M.A.: Council.  
 APRIL 6.—Queensland Branch, B.M.A.: Branch.  
 APRIL 10.—Tasmanian Branch, B.M.A.: Branch.  
 APRIL 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 APRIL 13.—Queensland Branch, B.M.A.: Council.  
 APRIL 17.—Tasmanian Branch, B.M.A.: Council.  
 APRIL 17.—New South Wales Branch, B.M.A.: Ethics Committee.  
 APRIL 18.—Western Australian Branch, B.M.A.: Branch.  
 APRIL 19.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 APRIL 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 APRIL 25.—Victorian Branch, B.M.A.: Council.  
 APRIL 26.—South Australian Branch, B.M.A.: Branch.  
 APRIL 26.—New South Wales Branch, B.M.A.: Branch.  
 APRIL 27.—Queensland Branch, B.M.A.: Council.

## Medical Appointments.

Dr. J. K. A. Hawker (B.M.A.) has been appointed Government Medical Officer at Adelong, New South Wales.

Dr. A. I. Branch (B.M.A.) has been appointed Government Medical Officer at Delegate, New South Wales.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xiv and xv.

- FEDERAL COUNCIL OF THE BRITISH MEDICAL ASSOCIATION IN AUSTRALIA: General Secretary.  
 LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer (male).  
 MENTAL DISEASES HOSPITAL, NEW NORFOLK, TASMANIA: Junior Medical Officer.  
 MOTHERS' AND BABIES' HEALTH ASSOCIATION (INCORPORATED), ADELAIDE, SOUTH AUSTRALIA: Honorary Medical Officer.  
 PARRAMATTA DISTRICT HOSPITAL, PARRAMATTA, NEW SOUTH WALES: Junior Resident Medical Officer.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 305, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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